

Boatswain's Mate
Journal

RESTRICTED



BOATSWAIN'S MATE ²/_c

NAVY TRAINING COURSES

NAVPER 10005

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fact that the system is not
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must be supported by the
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RESTRICTED

BOATSWAIN'S MATE 2c

PREPARED BY
STANDARDS AND CURRICULUM DIVISION
TRAINING
BUREAU OF NAVAL PERSONNEL



NAVY TRAINING COURSES
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PREFACE

This book is written as an aid in preparation for promotion from Coxswain to Boatswain's Mate 2c. It is one of a series of NAVY TRAINING COURSES designed to give enlisted men the background information necessary to perform their duties.

Qualifications for the rate of Boatswain's Mate 2c are listed in the appendix at the back of this book. With one exception, this training course contains information on all of these qualifications. Information concerning the location of emergency drill equipment is not included because such locations differ on different classes of ships as well as on ships of the same class built in different yards.

Beginning with an explanation of your duties as Boatswain's Mate of the watch, this course gives you helpful information on handling landing craft and whaleboats in surf and on the equipping and the provisioning of, as well as the hoisting and lowering of, the ship's boats. It continues with advanced information on deck seamanship and the use of the boatswain's call and concludes with pertinent information on the duties of a gun crew.

As one of the NAVY TRAINING COURSES, this book was prepared by the Training Courses Unit of the Bureau of Naval Personnel with the assistance of Naval establishments and personnel specially cognizant of the duties of a Boatswain's Mate.

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BOATSWAIN'S MATE 2c



CHAPTER 1

"BOATS" AT WORK

EVEN GARBAGE SCOWS

The Boatswain's Mate—and Coxswain—of the United States Navy is a JACK OF ALL TRADES, AND MASTER OF THEM ALL.

The crossed-anchors rating badge, as you know, can be found on the deck of every single vessel, be it 30 feet in length, or 800 feet, in Uncle Sam's gigantic sea-going organization. And, the guy who wears that badge is likely to be found at the wheel of a small power boat, handling signal flags on an APA, piping the crew of a BB to general quarters, or directing the work of a gun crew on a DD.

During the years of World War II, it has been the Navy Coxswain or Boatswain's Mate who has guided troop-laden landing craft through the surf towards an enemy-held island.

A Bosun's Mate might even be the SKIPPER OF A GARBAGE SCOW!

Twenty-one year old James P. Mealley, BM 1c was!

It was in 1944 that Mealley and a crew of 10 youthful sailors, most of them fresh out of boots, sailed a new 313-ton garbage lighter from an East Coast port to San Diego. They battled heavy winds, the ship's compass was faulty, and seas sometimes towered 40 feet. But they brought their ship to port in good old Navy tradition.

Meally had seen four year's service in the Navy when he was ordered to make the trip. Two ships—The *Langley* and the *Pecos*—had been sunk from under him. He still had a sense of humor though. He and his crew dubbed their ship—

“A garbage scow with a plow bow.”

AIMING TO PLEASE

Wherever you are; and whatever you may be doing, this training course is designed to help you up the Navy's ladder of success—from pay grade 4 to pay grade 3; from one stripe under those anchors, to two.

It's taken for granted that you're doing a bang-up job as a Coxswain; that a little brushing up on some of the finer points of your varied duties is all you will need to wear—proudly and justly—the rating badge of Boatswain's Mate Second Class, United States Navy.

While brushing up on those finer points, remember that you should be familiar with the duties of a bosun second no matter where he is stationed. Don't take it for granted that you can skip all the material concerning work aboard a capital ship simply because you happen to be skipper of a tug boat out in San Diego Harbor or a torpedo rescue boat off Montauk Point of Long Island.

You may have “struck a home” where you are but you may get your shovin' off papers tomorrow.

Also, the examination that you must take to get that \$18 a month raise covers the broad aspects of a bosun second's duties—not the individual duties performed by each man taking the test.

Remember, too, that you are supposed to know that Coxswain course at least as well as you know what telephone numbers to call in New York, Phil-



Figure 1.—Mealley and his mates use a pelorus to "Take a Fix."

ly, New Orleans, or Kalamazoo.

How well do YOU know it? Can you snap out the answers to these questions?

1. A good sailor doesn't "tie" two lines together, he?..... them together.
2. A?..... is the proper knot to use when you want to shorten a line.
3. Both variation and?..... must be taken into consideration in finding the total error of a magnetic compass.

4. Either parallel rulers or a ? can be used to plot a course on a chart.

5. Joe Boot says he saw a PT boat travelling 60 knots per hour. What's wrong with his statement?

6. Entering a harbor, you'd keep red nun buoys to port; or to starboard?

7. A Very's cartridge is just like a shotgun shell and it is permissible to fire one from a shotgun if you don't have a Very's pistol handy. True or False?

8. Describe a lubber's line; variation; a samson post.

9. You're heading out to sea past the Coast Guard station and notice a red pennant flying from the yardarm of the station's flagpole. What does that mean to you?

100 percent, hey! Might be a good idea to breeze through the Coxswain course again, though. Your educational officer might, and probably will, think up some harder ones. (The answers will be found at the end of this chapter, if you'd like to check them against yours.)

Now, let's get out to sea.

WATCHES AT SEA

BOATSWAIN'S MATE OF THE WATCH

At sea, the Boatswain's Mate of the watch is a pretty important gent. As assistant to the officer of the deck he is in direct charge of the deck watch section and must make sure that all of his men are thoroughly familiar with their duties before assuming watch.

You've been in the Navy long enough to know that punctuality is one of the key words of Naval service. As Boatswain's Mate of the watch, it is your responsibility to see that the watch is relieved

on time. Men having deck watch should be called 15 minutes before 8 bells. Reliefs for the wheel, lookouts, life buoy, and lead are called 5 minutes before 4 and 8 bells. Lead men, of course, are on duty only when entering or leaving port or when in dangerous waters. The lifeboat crew is called to muster at 5 minutes before 8 bells.

On most ships, the Boatswain's Mate of the watch reports to the O.O.D. when the deck watch has been relieved. He also passes commands originated by the officer of the deck, pipes the routine calls, and summons working parties. Don't wander out of hailing distance from the O.O.D. He is depending on you to be there when he wants you. In fact, don't leave your station unless ordered to do so. Other Bosun's Mates aboard will pick up your calls and pass them along.

While serving as Boatswain's Mate of the watch, it is your responsibility to see that things are ship-shape. Be on the alert to spot and correct anything that is lubberly and unseamanlike.

You will assign men to these watches—

LOOKOUTS

DAY—A lookout is stationed in the foretop from sunrise to sunset. He reports to the officer of the deck the sighting of all vessels, shoal water, rocks, land, lighthouses and other objects. On some ships, the foretop lookout is augmented by two other lookouts, one stationed on each wing of the bridge. (See figure 2.)

NIGHT—From sunset to sunrise, lookouts are stationed on each wing of the bridge. Duties are the same as the daylight watches but the night lookouts report the running lights of the ship on the hour. The starboard lookout reports first: "Starboard running light, mast head light burning bright, sir."

The port lookout follows with: "Port running light, range light burning bright, sir."

Lookouts are relieved every two hours, both day and night. Before leaving his post, the lookout points out all objects in sight to his relief and tells him of any special orders received. When properly relieved, he reports the fact to the officer of the deck.



Figure 2.—The port lookout studies the shore line as his ship heads for an anchorage.

In a fog, snowstorm, heavy rain or other condition of poor visibility, additional lookouts will be posted in the eyes of the ship.

Special lookouts are also stationed about the ship during wartime when contact with the enemy is possible or probable. Wartime lookouts are classified as either surface or sky lookouts and the number of men assigned to these additional posts will depend on the size of the ship upon which you are serving.

Although wartime lookouts are usually stationed and instructed by a commissioned officer, it is your duty as Boatswain's Mate of the watch to see that the men assigned to this duty are most suited for it. Use common sense. Pick your men carefully. Some men see better in darkness than others. Some are naturally good observers who see with both their eyes and brain. Some are alert; some aren't.

Wartime lookouts are furnished binoculars and stand short watches. They follow a definite prescribed routine for covering their sectors.

WHEELSMAN

Holding a ship on its course is not a difficult job once a man has acquired the knack. See that the men you assign to this duty can steer a compass course without zig-zagging all over the ocean. A poor wheelsman will cause the quartermaster, navigation officer, Captain and others to grow old ahead of their time. The usual mistake is to use too much rudder so that in attempting to bring the ship back to its course, the wheelsman brings it across the proper heading instead of on it.

The wheelsman is relieved every two hours. Upon being relieved, he reports both his magnetic compass course and his gyrocompass course to the O.O.D.

SPEED FLAGS AND SPEED CONES

Men are stationed at the speed flags and cones whenever the ship is travelling in formation. They must see that the flags and cones are smartly displayed as ordered. (Speed cones are displayed only when entering and leaving port.) Usually, the men are relieved every 4 hours. At night, a man is stationed at the speed light.

ENGINE-ROOM TELEGRAPH

On entering and leaving port and at other times as ordered, a man—usually a navigator's yeoman—is stationed at the engine-room telegraphs. He must repeat back all orders when the engine rooms have acknowledged them.

MESSENGERS

Messengers are stationed on the bridge. They are relieved every four hours.

LEADSMAN

When the ship is nearing land, leadsmen man the chains. It is customary to have two men at each station. They should be relieved every watch or as circumstances require. The "lazy" leadsmen, who hauls in the lead and sings out the sounding, does most of the work.

LIFE BUOY WATCH

The life buoy watch is manned whenever the ship is underway. Men on watch must be on the alert to heave or drop the life buoy at the cry "man overboard." There is an art to doing this. Seas, wind and direction and speed of the ship must be taken into consideration. The buoy won't do the man much good if it conks him on the head or is thrown out of his reach.

LIFEBOAT'S CREW

The lifeboat's crew is mustered with each watch. Members of the crew must remain in the vicinity of the lifeboat and be ready to man it on a moment's notice.

Now for your duties while in port—

WATCHES IN PORT

BOATSWAIN'S MATE OF THE WATCH

As at sea, the Boatswain's Mate of the watch is an assistant to the officer of the deck. When assigned to this watch in port, your duties are to pipe the side, pass the word as directed, organize working parties, assist boats in the water, hoist boats in and out of the water, etc. In general, you take charge of all jobs about the deck necessary for carrying out the routine of the ship which cannot be assigned to Boatswain's Mates in other parts of the ship. Supervision of jobs away from the quarterdeck are usually assigned to other men so that you can remain within hailing distance of the O.O.D.

As Boatswain's Mate of the watch, you supervise the sideboys and see that they are attentive and in uniform. You see that the quarterdeck is kept neat and that men at work do not congregate on it. It is your duty to make sure that boats coming alongside are given lines and you should inspect the sides frequently to see that they are clear of hanging lines.

After you have passed the command for the mustering of a working party, follow-up the order to see that it is being carried out, muster the men, and then report to the officer of the deck. If mustering of the party is delayed for any reason, report the fact to the O.O.D. along with the reason for the delay.

To make certain that time doesn't hang heavy on your hands, you will also—

See that men are sent to unload running boats returning with small freight;

Inspect the moorings of all boats alongside and at the booms;

See that boatkeepers are sent to the boats when weather makes it necessary, and that proper chafing gear is provided;

Assist the officer of the deck in getting boats to the gangway when they are called away.

During the morning watch, you call the bugler, the Boatswain's Mates and the watch. You pipe the routine as directed by the O.O.D., and—before 8 bells of the dog watch—call the anchor watch to muster.

You should assist the officer of the deck in every way possible and be on deck when he desires your services.

Port watches under your supervision are—

SIDEBOYS

The number of sideboys on duty will, of course, depend on circumstances; and the officer of the deck will tell you the number of men needed. Sideboys must be the “beau brummels” of shipboard life. Their uniforms must be spotless, their shoes must be shined, and they must be clean-shaven.

MESSENGERS

When not running a message, messengers must remain within easy call of the officer of the deck. They must know their way about the ship perfectly so that messages can be delivered promptly. Before leaving with an oral message, they must make certain that they understand it and then must deliver it EXACTLY as received.

ANCHOR WATCH

The anchor watch, usually a seaman, stands his station between 2100 and turn-to the following

morning when he is relieved by the messengers. He is an assistant to the gangway watch or to the Boatswain's Mate of the watch and is relieved every 4 hours.

GANGWAY WATCH

A petty officer is usually assigned to the gangway watch, particularly on smaller ships. His duties are covered in the *General Training Course for Petty Officers 3c and 2c*.

WARTIME SECURITY

The Boatswain's Mate's duties aboard ship during wartime include strict supervision of blackout regulations. Working with the security watch, the Bosun's Mate must see to it that all hands are observing the "darken ship" regulations. One ray of light peeping through an improperly dogged hatch is all that an enemy aviator needs to locate his target. Don't let YOUR SHIP be that target!

You are also expected to see that gun crews are alert and ready to start throwing lead at said enemy aviator if he should find your ship.

MASTER AT ARMS

In addition to the many other odd jobs that the Bosun's Mate falls heir to aboard ship, he is often assigned to be a master-at-arms. Here is where your ability as a leader and as a "boss" is piped on deck. The MAA can be a "HEEL" in the eyes of his men and thus make things hard for everybody concerned, or he can do his job with a "SOLE" and be respected by the crew.

You don't have to be told which man will do the best job; which will get furthest in the Navy.

MORNING WATCH IN PORT

Things really hum aboard ship during the morning watch and your job as a Boatswain's Mate is to see that the humming is in tune with the work schedule set up by the executive officer and enforced by the officer of the deck. Whether you are on watch or off, you are expected to assist in the swift completion of all duties which come under your jurisdiction. These include cleaning ship, working parties, hoisting out boats, fueling boats, and the like. Boatswain's Mates report to the O.O.D. at least 10 minutes before turn-to and are given their orders.

The routine differs for each day of the week but is usually the same for the same day of any week. Work starts promptly at turn-to and there's no time for goldbricking. Your first duty, then, is to see that your men are on the job. Lay up all gear clear of the decks, break out wash-deck hose, buckets, sand, squilgees and other gear and see that pressure is on the fire mains for washing down. Turn off the pressure on leads of hose that are not in use so that better pressure can be had where needed. See that men do not make too much noise while working on the quarterdeck.

Decks should be scrubbed and washed down in 45 minutes if the men are on the ball. Often, too much time is spent on the decks. See that your men do a good job but see that the job is done with all possible speed.

When boats are to be hoisted out, make certain that all men and equipment are on deck ready to do the job. When a boat is called, the officer of the deck wants a BOAT, not an excuse.

Boats are usually fueled during the morning watch so that they will be ready for service on a

minute's notice during the remainder of the day. Gasoline and fuel oil for the ship's boats are carried in storage tanks or in 50-gallon drums. On larger ships, the drums are carted by a deck truck to the part of the deck handiest to the boat. A special fueling hose is used—it has a valve near the filler end so that the flow of fuel can be cut off when a tank is filled without losing any fuel remaining in the hose. See to it that the grounding connection is used properly when fueling boats or planes. (Figure 3.)

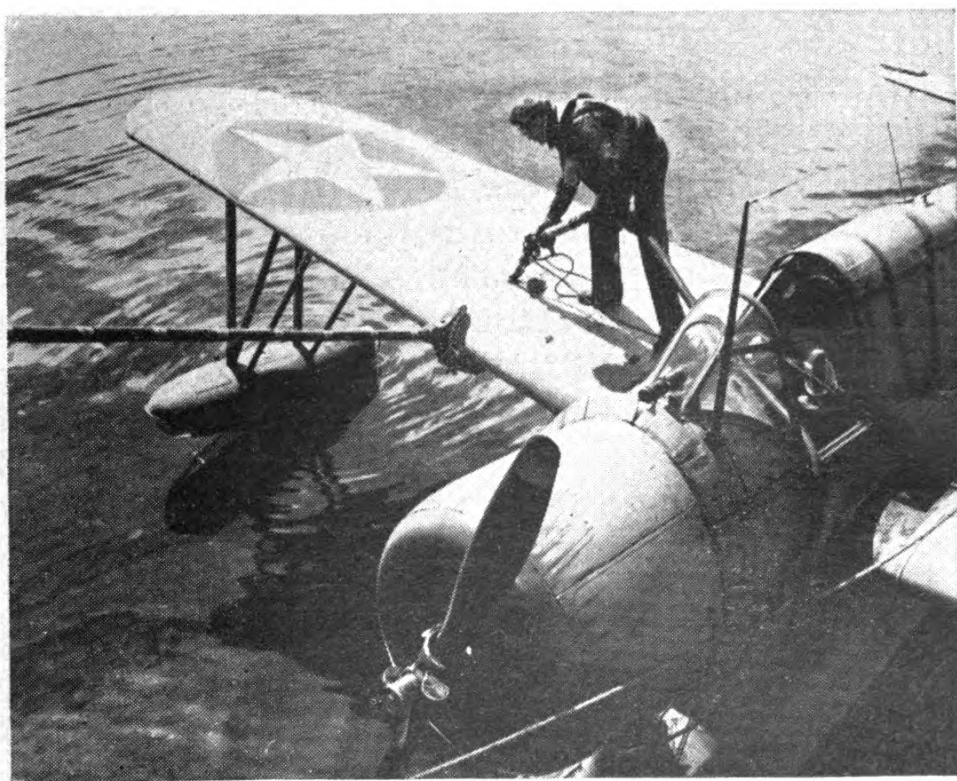


Figure 3.—A Navy Kingfisher "gasses up" from a seaplane tender in the Aleutians.

Empty drums should be EMPTY, closed tightly, and stowed separately. They should be handled carefully. It is no longer necessary to fill them with water.

If working parties are to leave the ship, see to it that the men are ready to shove off on schedule. If

one or two men are missing from a large working party, don't wait for them. Working parties going ashore for supplies should be furnished with lines, whips, and tarpaulins. All boats sent for supplies should be equipped with cargo nets and paulins. Men who are to be sent into cold-storage holds to stow perishable grub should be made to wear heavy underwear and blue clothing.

If the bedding is to be aired, see that it is brought on deck and supervise its disposition along the rail so that there are no "holidays." This is an excellent time to inspect bedding for cleanliness. See that the owners of dirty blankets give them the soap and water treatment.

Oily canvas can be scrubbed with sand, but sand should NEVER be used on fire hose because it will cause the hose to wear out rapidly.

Men are usually allowed a half hour to scrub clothes after turn-to. This should not be done, however, until the decks have been wet down so that soap will not stick to them. When a ship is stationed in the tropics, men are allowed to scrub clothes on the weather deck after "knock-off."

If breakfast is at 0730, make every effort to have the decks dried by 0700. Don't forget to relieve the boat keepers for breakfast. If life buoy watches are posted, also see that they are relieved. This is the proper time to detail and inspect the sideboys.

If you are the Boatswain's Mate in charge of a compartment, see that the mess cooks are up and about and that compartment cleaners are at work. Men who have had night watches and are allowed late hammocks should be roused out at 0700.

MOORING AND DOCKING

Good seamanship aboard ship is most important when the ship leaves her natural environment out

on the briny deep and comes in to moor or dock. If the ship is to be anchored, tied to a mooring buoy or secured to a dock in ship-shape fashion, "all hands" must work as a team, each filling his position with all-American skill.

As the Coxswain of a small boat, you've undoubtedly sat on a dock spile and admired the way in which other boats have come in or gone out under various weather conditions. You have also scoffed at the Coxswain who made a sloppy landing. When you get to be an old "sea dog," you thrill at the beauty of a boat or ship smartly handled and shudder with disgust at a display of lubberly seamanship.

As Boatswain's Mate aboard ship, you are one of the key figures in the maneuvering of your vessel when mooring or docking. Your orders to the seaman must be given at exactly the proper time and your men must be trained to execute them perfectly.

Your duties, as a Boatswain's Mate 2/c, vary according to the class of ship on which you are stationed and according to your duty location aboard the ship. They also are different when the ship is to be moored and when it is to be docked. As is the case in practically all of your work as a Bosun's Mate, experience in your job outweighs all other methods of learning.

ENTERING PORT

Generally speaking, the Boatswain's Mate stationed on the quarter deck of a typical Navy vessel is in charge of the gangway detail as the ship makes ready to enter port and moor. The Bosun's Mate midship supervises men working on the boats and booms and the BM on the foc'sle sees that the anchor gear is broken out.

If the ship is to be docked, Boatswain's Mates on the side of the ship that is to lay alongside the pier,

must see that hawsers, heaving lines, fenders and other docking gear are ready for use and manned. If boats on that side of the ship are to be needed while the ship is at her berth, they must be manned and lowered before the dockage is reached.

Similarly, if the ship is to be docked at a port where a dock crew cannot be expected to be on hand, men must be sent ashore in a small boat to catch the heaving lines.

PREPARING FOR HARBOR

When a ship prepares to enter a harbor, the first step is to send the leadsman to the chains. The officer of the deck will give the order, and you must have your men ready so that soundings can be taken immediately. (Figure 4.) Other procedures are—

Get the anchors ready for letting go.

Rig the gangways.

Pipe down scrub and wash clothes. A ship is never allowed to enter port looking like a floating laundry.

Remove gun and searchlight covers. This is done by gunner's mates and electricians but the Boat-swain's Mates must check to see that it has been done.

Have lower and quarter boom rigged for running out.

Get boats ready to go out.

Inspect the side to see that it is clear of loose ends.

MOORING

A vessel **MOORS** when she lets go two anchors at a considerable distance apart and equalizes the scope of chain on each so that the bow is held approximately midway on a line between them.

The two chains act as a bridle. The tension on the chains is greatly out of proportion to the power

used for holding the ship. Consequently, a moor is used in restricted waters only. Its chief advantage lies in the fact that the ship swings about her stem



Figure 4.—The leadsman heaves the lead as the "lazy" leadsman stands by to haul it in and a seaman phones the sounding to the bridge. Thus, a new U. S. battleship creeps cautiously into port.

in a circle whose radius is only slightly larger than the length of the ship.

There are two mooring procedures, the ORDINARY MOOR and the FLYING MOOR. The U.S. Navy prefers

the latter.

ORDINARY MOOR—

In the ordinary moor, the vessel moves upstream to the point where it has been decided to place the riding anchor for the current condition then in effect. That anchor is dropped and its chain veered while the vessel drifts back until it is riding to a scope of chain TWICE as long as the scope to be on each chain at the conclusion of the operation.

The second anchor (lee anchor) is then dropped and the scopes of chain equalized by veering the lee chain while heaving in on the riding chain. The two chains are then coupled to the mooring swivel.

FLYING MOOR—

The first anchor (lee anchor) is let go while the ship has way on. As the vessel ranges forward and the chain is laid out, the engines are backed and the ship stopped. Then, the second anchor (riding anchor) is dropped. The chain to the first anchor is heaved in until the proper scope is out, the mooring swivel is put on, and the operation is completed.

AN EXAMPLE OF THE FLYING MOOR—

The tide is ebb and your ship has been ordered to moor with 45 fathoms of chain to each anchor. The ship steams slowly to the spot at which it is to lie at anchor and the lee anchor is let go. The lee chain is now veered as the ship goes ahead and the chain is layed out.

When about 90 fathoms of lee chain have been let go, the ship's headway is stopped and the riding anchor is dropped. The ship starts to drift downstream. The lee chain is hove in and the riding chain veered until the 45-fathom shackles on both are a short distance abaft the forward chain stoppers. The ship will now ride to the last anchor let go.

MOORING SWIVEL—

The anchor shots of both chains and the nearest

capstan shot are coupled to the mooring swivel to keep the anchor shots from crossing and twisting when the ship swings.

Identical shackles of both chains (the 45-fathom shackles in the preceding example) are brought together on deck with BOTH CHAINS PASSING THROUGH THE SAME HAWSEPIPE.

This can be done in two ways. The ELDRIGE way, or the O'NEIL way.

Using the ELDRIGE method, the chain of the anchor that is to be the riding anchor is unshackled. The end of the anchor shot is drawn out through its hawsepipe, around the bow, back through the other hawsepipe, and reshackled to its own capstan BEFORE THE ANCHORS ARE DROPPED. During this operation, both anchors are suspended outside the hawsepipes and are secured by deck stoppers and PREVENTERS.

In the O'NEIL method, the lee chain is unshackled and passed around the bow AFTER the anchors have been dropped.

SPECIAL EQUIPMENT

In addition to regular ground tackle equipment such as capstan, deck stoppers, housing chain stoppers, chain hooks and tackles, you'll need special equipment for either method.

A CLEAR-HAWSE PENDANT is used to support the weight of chain out on the lee anchor and hold the chain securely when it is unshackled on deck and transferred to the other hawsepipe. The pendant is about 30 fathoms of wire rope shackled to a 6-fathom length of open-link chain, which is about half as large as the anchor chain. A pelican hook is secured to the end of the chain.

The DIP ROPE is led out through one hawsepipe, around the bow, into the other hawsepipe, and is

shackled to the end of the anchor chain that is to be dipped. It is used to haul this anchor chain around the bow and into the other hawsepipe. A dip rope usually consists of about 6 fathoms of 3-inch wire or an equivalent open-link chain and a 30-fathom length of 7-inch manila. A shackle large enough to engage a link of the anchor chain is attached to the length of wire or chain.

AN EASING OUT LINE, usually of heavy manila, is used to pay out the chain being hauled around the bow.

A PREVENTER is a length of heavy manila or wire shackled to a pelican hook or SELVAGEE for grasping the chain. A selvagee is a length of manila or hemp rope or sennit, or strip of heavy canvas, which—when wet—will wrap closely around a chain and cling to the links.

MOORING TO A BUOY

You probably won't have to moor to a buoy unless you're aboard a destroyer or smaller Naval vessel but the procedure is one of those you should know to be a first class Boatswain's Mate 2c.

The operation sounds as simple as Simon—all you have to do is lead an anchor chain through the ring on top of the buoy and back to the deck. Actually, it's like threading a needle while riding a horse.

Here's the way it's done—

A boat is hoisted out with one of the more expert seamen aboard. When the ship has maneuvered into position so that its bow is over the buoy, a securing line is passed to the boat and a shackle is bent on the end of the line.

The seaman is then put aboard the buoy and given the shackled end of the line which he affixes to the mooring ring.

The man is taken off the buoy until the slack on the securing line is taken up on deck and the ship has steadied in its mooring position. He then is re-

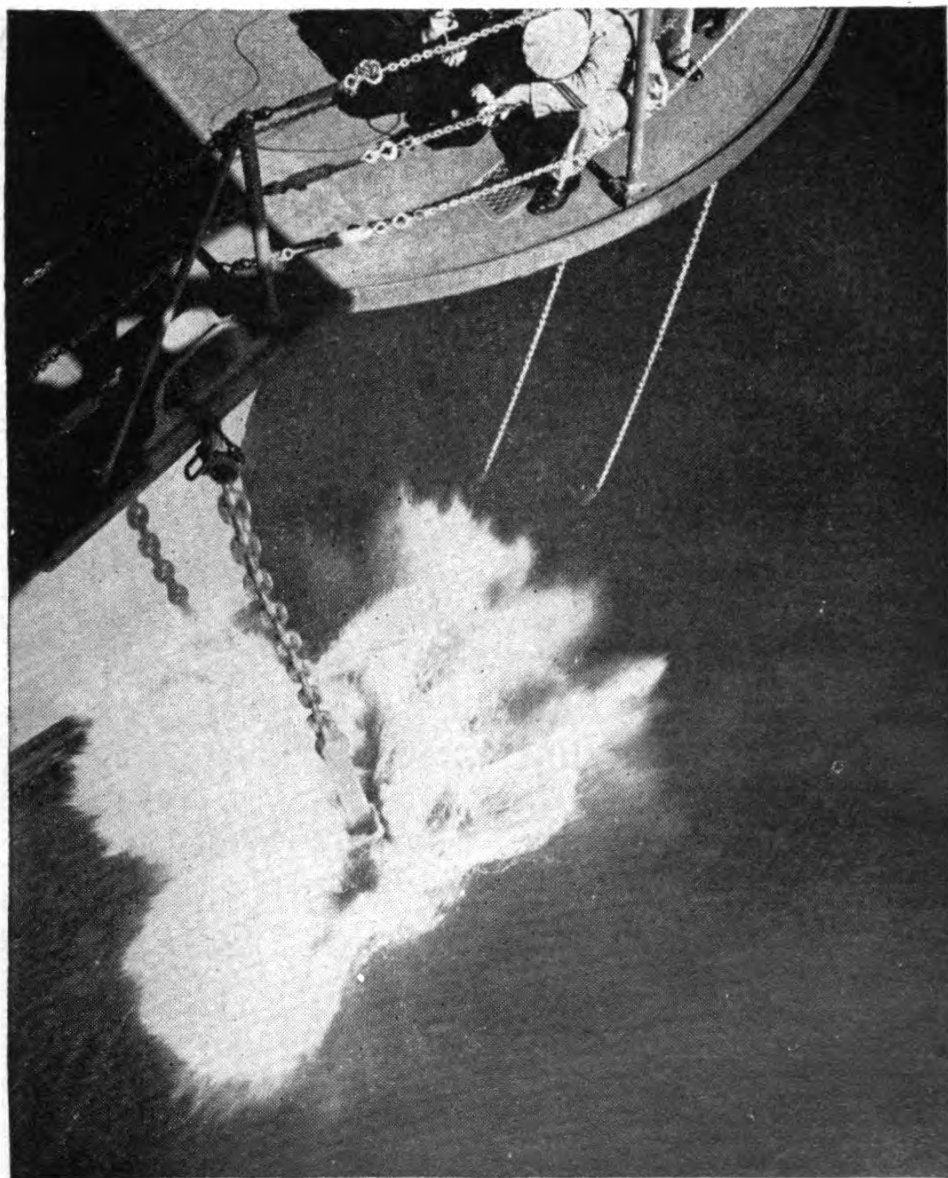


Figure 5.—A chief Boatswain's Mate supervises as the starboard anchor on a carrier hits the water with a splash.

turned to his perch on the buoy and given a dipping line (secured to the deck) and a heaving line.

The dipping line is led through the ring and the bitter end of the heaving line is bent to it. The seaman again returns to the boat and throws the heav-

ing line to the men on the bow of the ship.

Aboard ship, the dipping line is secured to the anchor cable and the whole works is pulled through the ring on the buoy. It may be necessary for the seaman to return to the buoy to ease the chain through the ring.

Once the chain has been stopped on deck, the securing line is unshackled and hauled back aboard the ship.

Not quite as easy as it sounded, is it? Not too difficult, though, if everybody knows his job—and does it with speed and skill.

MOORING TO A DOCK

Hawsers are heavy lines used for towing or mooring a ship to a dock. At present you are concerned only with their use for mooring purposes.

Manila hawsers for mooring large ships are 120 fathoms long and WIRE mooring hawsers are 100 fathoms in length. A towing hawser is 150 fathoms of $2\frac{1}{4}$ inch wire rope.

A ship is moored to a dock with either 8 lines as shown in *A* of figure 6 or with 7 lines as shown in *B*.

In *A* of the illustration, No. 1 is the bow line; 2, forward spring line; 3 after bow spring; 4, forward quarter spring; 5, after quarter spring; 6, stern line; 7, forward breast; 8, after breast.

In *B*, the newer method of mooring to a dock, lines are numbered on deck from 1 to 7 beginning with the bow line and ending with the stern line. The chief difference is that this method uses only one breast line as shown.

The bow line and forward springs prevent the ship from drifting astern.

The stern line and after springs prevent the ship from moving forward.

Breast lines prevent the ship from moving away from the dock.

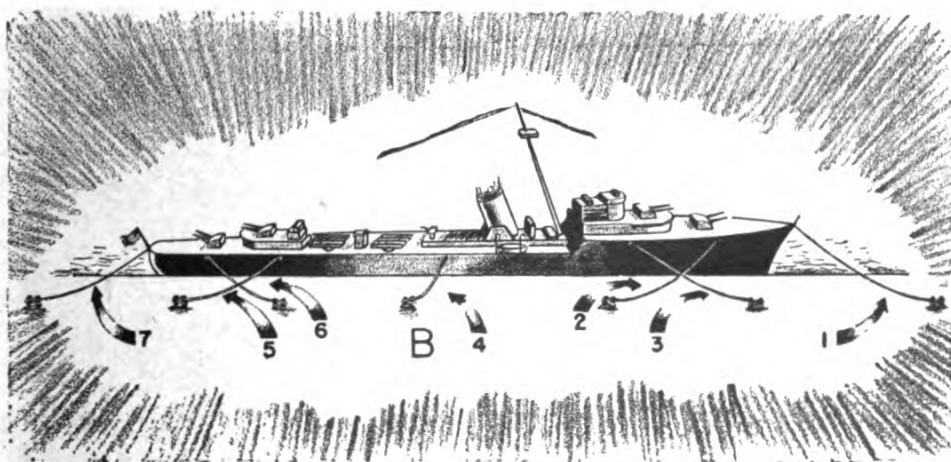
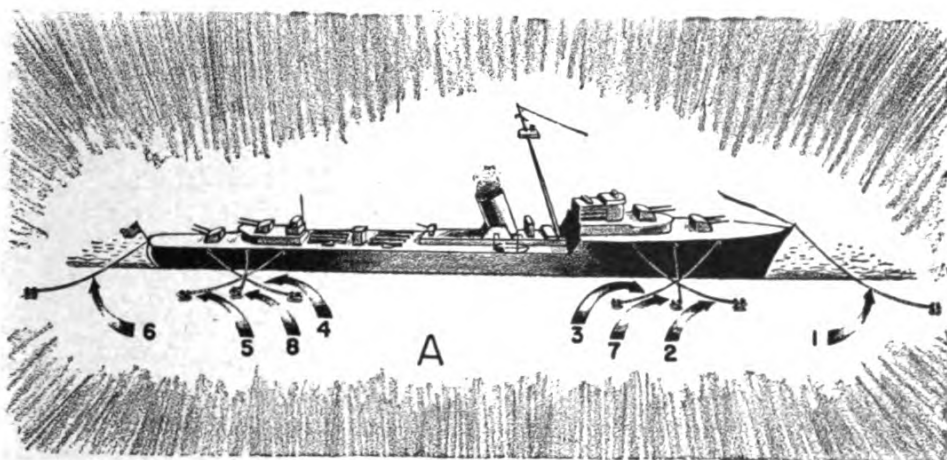


Figure 6.—Two methods of mooring to a dock.

Before the ship nears the dock, all of these lines should be faked down, fore and aft if possible, near the chocks through which they will pass. The looped ends of the lines should be passed through the chocks, heaving lines bent on, and the loops laid back on the life lines.

It is customary to use mooring lines to WARP a ship into position alongside a dock after one or two

lines have been put ashore. This follows exactly the handling of a small boat insofar as position of the rudder, use of engines, and use of lines is concerned. The only difference is the big one—size and power of vessel.

Orders must be obeyed **ON THE DOUBLE** and executed accurately. When using the 8-line method of mooring, “**HOLD ONE**” means secure the bow line. “**KEEP SLACK IN TWO**” means that there should be no tension on the forward bow spring. “**CHECK THREE**” means that the after bow spring is to be payed out a little at a time.

If you and your men do not obey these and other orders as they should be obeyed, the value of the maneuver is apt to be lost and docking made much more difficult. Also, lines may be parted as a result of poor seamanship.

Lines are **SINGLED** while the ship is being moored to the dock but are **DOUBLED UP** in securing. When doubling up, the lines should be rove around so that each part is of equal length. Otherwise, one part of the hawser would carry the full strain.

RAT GUARDS (circular metal disks), are always installed on the mooring lines of a docked ship so that rats cannot get aboard—or ashore. Figure 7. The disks are made in halves and lashed together on the hawsers. Rats are such a menace in some ports, that seamen must be stationed on the dock at the gangplank to keep them from boarding the ship at that point.

MOORING STAPLES are permanently affixed to the sides of larger ships. These staples are large, oblong metal eyes to which chains can be attached in securing to a dock. Battleships usually have three on each side.

FENDERS also play an important role in the docking of a ship. They should be “on deck,” ready for

instant use as the docking procedure begins. They must be placed at strategic spots to prevent the ship's side from being marred by contact with the

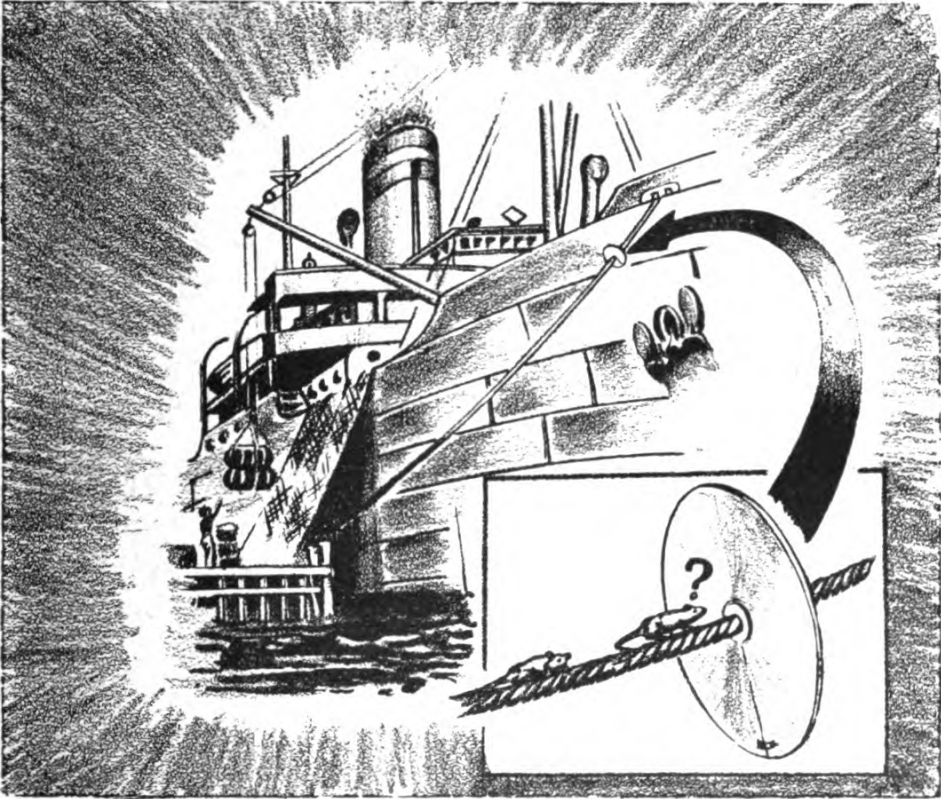


Figure 7.—Rat guard.

dock or spilings both while the ship is maneuvering and after it has been secured.

ANSWERS TO QUIZ

1. Bends.
2. Sheepshank.
3. Deviation.
4. Protractor.
5. "Knots" means nautical miles per hour. Use of "per hour" after the word knots is therefore lubberly.
6. To starboard. R-R-R rule: *red to right returning.*

7. False.
8. Lubber's line is the mark on a compass which parallels the fore and aft line of the boat. Variation is the difference between "true north" and "magnetic north." A samson post is a hard wood "hitching post". It goes through the deck and is secured to the keelson for extra strength.
9. The red pennant is a small craft warning meaning that seas are pretty tough for small boats.



CHAPTER 2

HANDLING BOATS IN SURF

NAVY LANDING CRAFT

The bootleggers of America's famous (or infamous) Prohibition era didn't know it at the time, but they contributed materially to the speedy development of the efficient landing craft that have seen action in all theaters of World War II.

Before Tojo and Hitler took to the warpath, Navy landing craft consisted chiefly of whaleboats. A field piece and men to man it were loaded in one of them and the boat headed for shore. When it grounded, the men leaped over the sides and began the long, back-breaking job of getting the damned 3-incher out of the boat and on dry land. Planks were lashed to gunwales to form a ganplank from boat to beach. Rollers, block and tackle, and other sundry pieces of equipment were brought into play, and—if things went well—sooner or later the field piece was ashore and ready for action.

Not much fun to go through all that rigmarole—

particularly if enemy machine gun nests along the beachhead are slinging hot lead your way.

Yes, America's fighting forces needed greatly improved landing craft before starting out to knock the Japs and Nazis back where they started from. That's where the bootleggers came in. Rum runners operating in the Caribbean during prohibition had been faced with the problem of putting heavy cargoes ashore on out-of-the-way beaches. To solve it, they designed a special type of high speed, spoon bowed, shallow draft barge. Its bottom was designed to stand up under successive groundings on sand bars and beaches.

"Equip this rum runner with a ramp and where could you find a better landing craft?"

That's what American boat builders said as the Navy and Army cried for speedy delivery of boats with which to put men and material ashore.

So, America's heroes of World War II have been skippers of, and passengers in, boats originally designed to haul bottles of John Barleycorn.

Either you have been, or you will be, assigned the job of guiding one of these boats ashore. Peace time or war time, these landing boats will be important parts of any great Naval power. Some of the United States Navy's smaller landing craft are pictured here so that you will be familiar with them.

GET IN—GET UNLOADED—GET OUT

"D DAY" has arrived at last. It's just 30 minutes before "H HOUR." Marines and soldiers, keyed to a fighting pitch, are giving their guns a last check. Pilots are being briefed on their strafing duties, the big guns have been pounding the enemy's fortifications all night and the ship bustles with activity and excitement from stem to stern. YOU are getting last

"ELSIES"



Figure 8.—The LCP(L)—(Landing craft, personnel, light)—a speedy landing boat which gets troops ashore in a hurry. Armed with two light machine guns.

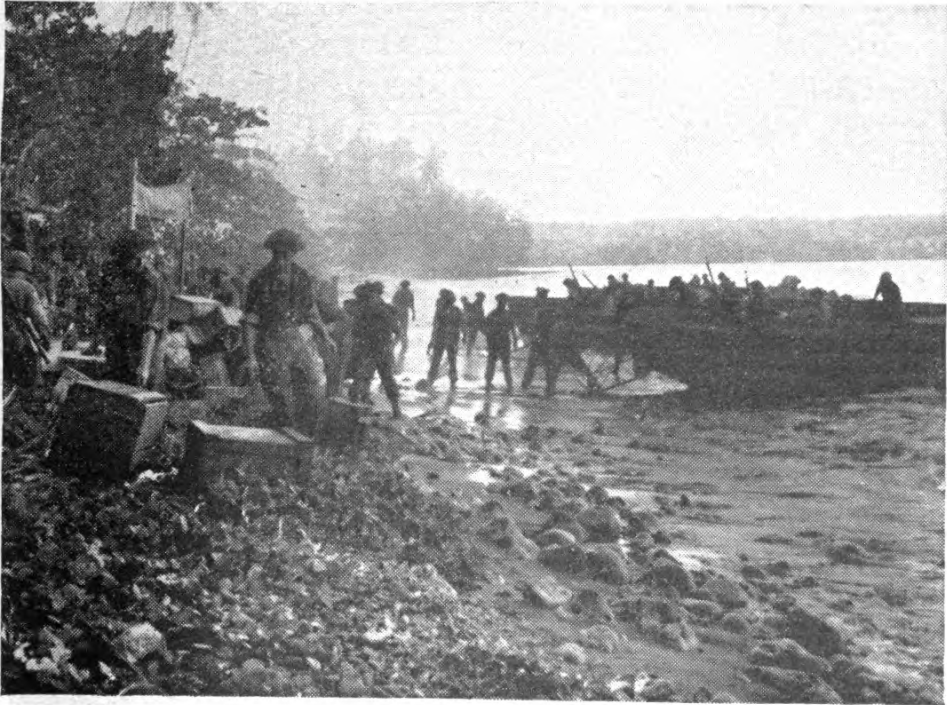


Figure 9.—LCP(R)—(Landing craft, personnel, ramp)—are run far up on the shore of MONO as New Zealanders, forming the second wave, hasten to get supplies ashore.

minute instructions before taking your place at the helm of an LCV. **YOUR JOB IS SIMPLE—**

ALL YOU have to do is head that boat for shore, unload your cargo of men and equipment and then get back to the ship on the double. **THAT'S ALL.**

BUT it's going to take good boatsmanship to get that LCV away from the ship and headed for the beach. It's going to take a little more than that when you hit the breakers and start the drive for the shore. And, it's going to take a "certain something" to get that boat off the beach after you've unloaded.

BEACHING

Your first job in beaching is **TO GET TO THE BEACH.** That may include fighting your way across sand bars that intervene between ship and shore.

Second worry is to hit that beach just right—so that you put your passengers ashore high and dry and don't **BROACH** your boat.

Condition of the sea is important to the skillful accomplishment of these tasks. If seas are extremely large, you're in for a really tough time of it. Assuming a moderate 4 to 7 foot sea, however, you should be able to **GET IN** and **GET UNLOADED** without too much trouble.

If there is a bar between you and beach, try to hit it riding **ON THE BACK OF A WAVE** as shown in figure 13. This will cause your stern to ground first and the bow to travel well onto the bar. If you hit the bar bow first, the next sea is likely to pick up the stern and throw the boat into the trough of the sea, parallel to the beach. That's called **BROACHING** and a decidedly uncomfortable—and dangerous—sport it is.

Once you hit the bar, keep the engine in forward speed, throttle it down, and wait for the next wave to lift you off the bottom and towards the beach.



Figure 10.—Swarming ashore in landing boats of all kinds, U. S. Marines establish a beachhead on Emirau island in the St. Matthias group. Time, March 1944; boats, LCVP's and LCT (6)'s.



Figure 11.—An LCVP picks up a couple of casualties after landing Marines on Namur, Kwajalein Atoll. Landings were made after what was then described as the "heaviest Naval and air bombardment in history."

When it does, gun your engine and drive for the shore. Repeat this process until you have cleared the bar. Remember to gun the engine **ONLY** when a sea has picked you off the bottom—keep it at idling speed when you're sitting on the sand.

Often when you seem to be hopelessly stuck on the bar, you can dig your way across by using your propeller stream. Drive onto the bar at full speed. Soon as your forward motion has stopped, reverse your engine with rudder amidship. Run the engine at a **MODERATE SPEED**. (At full speed, you'd merely back off the bar and that's not the way you want to go.)

The wash from the reversing propeller will wash the sand away from the keel and thus dig a narrow channel in the bar. As it does, the boat will naturally start to back off the bar. Now, throw your engine into forward speed and drive ahead with full throttle. Guide your boat to hit the hole. When forward motion stops, repeat the process and you'll soon be across.

Once beyond the bar, drive for the beach with wide open throttle.

If this channel dredging maneuver doesn't work, if you're just plain hard aground for keeps, use the boat hook or sounding pole to check the depth of the water ahead. If it's shallow all the way to shore, you can unload where you are. If not, **YOU'LL** have to size up the situation and solve it the best you can.

One good trick is to shift your cargo to "sally" the boat back and forth so that the seas can pick it up and push it forward. One ingenious Coxswain got his boat off a bar by ordering his passengers to jump into the air at a given signal. He gave the signal just as an extra large wave hit his stern. The wave picked up the lightened boat and the Coxswain gave the throttle full speed ahead.

P.S. Passengers were shaken up just a little.

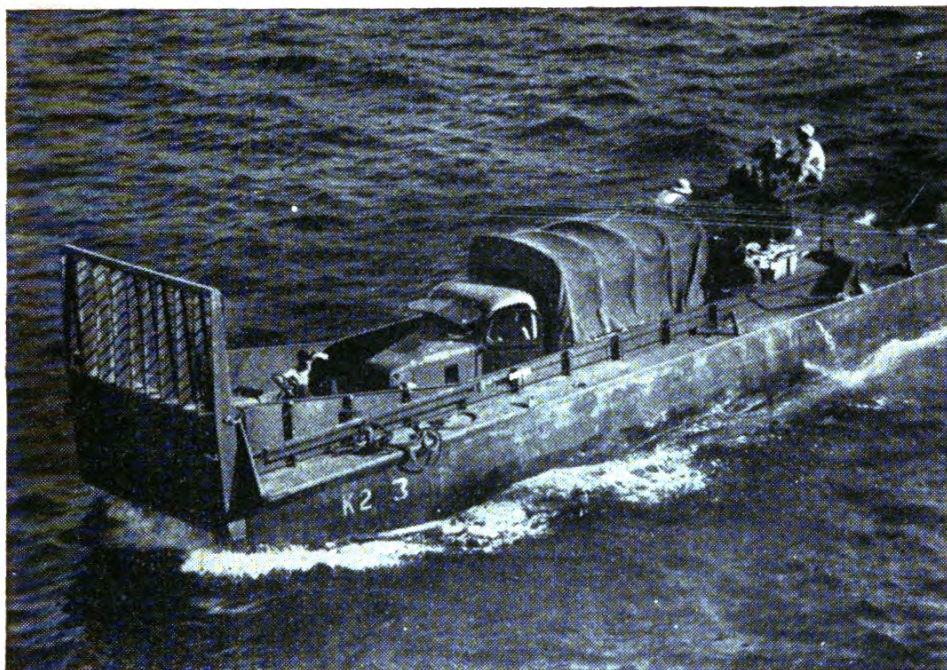


Figure 12.—An LCM, Navy manned, churns in toward Espiritu Santo Island in the Hebrides with an Army truck aboard. The coxswain nonchalantly steers with his feet but lookouts are on the alert.

You'll have to be ingenious too. Have a bag of tricks on hand and be ready to pull out a couple when they're needed.

RIDING THE WAVES

Once past the bars and driving for the beach again, maneuver so that you hit the beach on the back of a wave as you did in hitting the bar. Get as much weight aft as you possibly can. The instant you hit, throttle the engine down and wait for the following sea to pick you up. When it does, give her full throttle and drive up the beach.

There may be situations on a long, shelving beach in which you have to drive your boat a long way in shallow water before reaching dry land. If so, push right along using waves and horsepower to get you there. Keep pushing ahead as long as you can—don't make your passengers get out and walk.

If there is no sea running, cut your engine a length or two off the beach. When your own stern wave catches up with you and lifts your stern, gun



Figure 13.—Ride in on the back of a wave.

her up onto the beach. Bars can be crossed in the same way in a calm sea.



Figure 14.—Look out for broaching. Boat at left did; boat at right is in trouble.

Remember, BROACHING is a horrible word. It's worse than a mere word when it happens to your

boat. Fight to keep the seas dead aft—both while you are driving for the beach and while you are on it. If your boat is grounded along the entire length of her keel and your engine is idling in forward speed, she'll stay put. If you're on a steep beach, though, your stern will probably be afloat and the



Figure 15.—Keep up with the tide.

seas will tend to push the stern onto the beach. When this occurs, you'll have to stand by the helm with motor running. When the stern starts to work in, put your wheel over in the direction the stern is slipping and throttle the engine a little.

While you are sitting on the beach, make sure that your salt water intake is sucking water so that the running engine is cooled. If necessary, heel your boat over to get the intake in the water.

If you are to be on the beach for a fairly long

time, stand by to work your boat up on the beach as the tide rises and to inch it off as the tide falls. The upper part of figure 15 shows a boat attended properly. Crew of the boat in the lower drawing left their boat unattended and returned to find it high and dry.

NEVER LEAVE YOUR BOAT UNATTENDED!

RETRACTING

O. K. You've made the beach and unloaded your troops. Now to get that boat back where a boat rightfully belongs—in deep water.

Your engine should be idling in forward speed as you prepare to retract. Leave it in forward and rev it up to about 600 to 900 rpm. The stream of water that shoots aft from your propeller will dig a good passageway behind you. Make certain that your rudder is straight. (Mark the king spoke on your wheel to make sure.)

Now, throttle down, switch to reverse gear and advance the throttle. She'll start to dig herself right off the beach. Be patient and don't gun your motor unless absolutely necessary. Reversing too fast in shallow water has a tendency to suck the stern down and you'll simply be inviting trouble. A slow speed, on the other hand, will tend to scoop the sand from beneath the keel and will also push forward a wall of water that will help float the boat.

Handsome does it, as you feel the boat start to edge off the beach. Keep her going slowly and steadily. As soon as you're free of the beach, cut your speed so that you have just enough motion astern to maintain steerageway. Too much speed and you'll go into a spin that will throw you back on the beach broadside-to—BROACHED.

You'll spin her around only when you are far

enough off the beach and in deep enough water to avoid the danger of being tossed right back where you started from.

If there is a heavy sea rolling in, execute your spin rapidly. Start your turn while still in reverse by gunning the motor and letting the boat start to broach. Do this just after you've risen over the crest of a wave. Gun her again as you hit the middle of



Figure 16.—Up and over, not through.

the turn. Then snap the wheel all the way over in whichever way will straighten the boat into the seas. You will have completed your turn while in the trough and be ready to meet the next crest head on.

Don't hit it too hard, though. Gauge your speed so that the boat rises up and over the crest of the wave as shown in the bottom drawing of figure 16. Too much speed will drive your bow into the wave and probably swamp you. (Top of figure 16.)

All this, of course, is not as simple as it sounds.

Your maneuvering will depend on the type of beach and sea condition you encounter.

CALM weather and a STEEP beach and you could turn the helm over to a Seaman 2c while you catch a little shut eye.

CALM weather and a SHELIVING beach means more skill is needed in retracting, but you should be able to get clear of any beach that you've run on to.

HEAVY WEATHER—HEAVY WORK

HEAVY weather and ANY TYPE of beach and you'd better be on the ball. The surf may be short and steep or long and rolling. It may extend far off shore or go only a little way. It may run straight onto the beach or hit it at an angle. You might find retracting a darned sight harder than beaching.

Suppose you're on a steep beach and seas are about 5 feet high. You've been holding your stern into the waves by keeping the engine running in forward gear. (If the water is fairly shallow under your stern, this forward spin of the prop will have cleared a passageway astern. Either way, you're all set to go.)

Watch the seas so that you know exactly how they are running. Get ready to go when you spot a large wave followed by a couple of smaller ones. As the big wave lifts the boat, give her the gun IN REVERSE and head her out straight and fast until you've got plenty of water under you. Then, ride the waves more slowly until you get a chance to spin the boat around.

If you are trying to move off a shelving beach in a bad surf, the toughest part of the job will be to get started. Channel dredging via the propeller-spinning method is almost impossible—it can't be accomplished unless the propeller is under water

all the time. Here again, you'll have to depend on the power of the seas and your reverse gear.

As each wave lifts your stern, gun the engine in reverse until you ground again. Keep it up. Each maneuver will help you move a few feet. When you clear the beach, reduce your speed and continue in reverse until ready to spin her.

Use this same procedure if you've got to cross that darned bar again. Hang on though! Hold the wheel firmly, using your knee if necessary. When you hit the bar stern first, the rudder will knife into it and the wheel will try to spin out of your hands. **DON'T LET IT.** Nothing will break if you hang on.

If you let go, the rudder will be pushed hard to one side, the wheel is likely to break a few of your fingers, the quadrant will fetch up hard on one side and probably snap, and the boat will undoubtedly **BROACH.**

Here's a helpful hint on that bar jumping business. You'll find that a bar will usually break up the seas and you'll have moderate waves between beach and bar. This means that you won't have to wait so long before you can spin the boat. You'll probably be able to do it before you reach the bar and can thus bounce your way across bow first, which is a much easier operation. In this case, you'll have the engine running ahead slowly until a wave picks you up at which time you'll give her the gun to make the leap.

SUMMING UP.—The important thing for you to remember with reference to these beaching and retracting problems is that every time you take a landing craft ashore you'll encounter different weather conditions, different types of seas and different types of beaches.

The problems faced on rocky beaches, in landing amongst boulders, on coral, mud, and quicksand, are difficult ones. You'll have to be good to solve

them. Practice will make you good. Experience will fill that bag of tricks.

If possible, H-hour will be near or at high water and you may have to pick your way ashore through submerged boulders and reefs. Be on the alert for possible trouble. Have the pumps ready and manned and see that there is a canvas patch, hammer, and nails, ready to be used. Observe the progress of the boats ahead of yours—follow the course of the boats that get through.

BEACHING A WHALEBOAT

Handling a whaleboat in the surf—both beaching and retracting—follows, to some extent, the procedure in handling the landing craft just described. This is particularly true with regard to the dangers of having your boat BROACH-TO in the surf. Whaleboats, however, are designed for deep-water operation while the newer type landing craft were built for the specific purpose of landing men and supplies on beaches.

This means that the beaching and retracting of these regular ship's boats require a few variations from landing craft procedures.

For instance, experienced surfmen have long used the trick of beaching their boats STERN FIRST. The boat is turned around outside the line of breakers and proceeds toward the beach in reverse. As a heavy breaker bears down on the boat the engine is shifted to forward speed and the boat is propelled seaward to meet the wave and begins backing shoreward again after the sea has passed. It is easier to prevent the boat from broaching in this manner.

When the boat approaches the beach BOW FIRST, the same maneuver is used but in reverse. In this case, the boat engine is reversed upon the approach of a large breaker. When the wave has picked up the

boat, the engine is shifted to forward speed again and revved up for the drive to the beach.

A DROGUE is almost always used when taking a motor whaleboat or a motor boat through the surf. The standard drogue is a conical-shaped bag somewhat the shape of a wind sock at an airfield and is about 2 feet wide at the mouth and about $4\frac{1}{2}$ feet long. It serves to control the speed of the boat and to keep it from broaching.

The drogue is towed by a TOWING LINE and a TRIPPING LINE is attached to its mouth. When the tripping line is slackened, the bag fills with water and offers considerable resistance to the forward motion of the boat. When the tripping line is tautened, the bag empties and tows flat, offering little if any resistance.

In operation, you would allow the drogue to fill on the approach of a large sea and to empty as the boat started to ride the back of the wave toward the beach.

THE ANCHOR TRICK

Another method of getting a boat to the beach without broaching and swamping is that in which an anchor is dropped outside the surf line. The anchor line is then payed out as the seas carry the boat toward the beach. The taut anchor line prevents the boat from doing anything but riding the seas head-on.

This maneuver has the very great advantage of making it much easier to retract the boat from the beach, as you can easily imagine. The anchor method cannot be used, however, when there is a strong current running parallel to the beach, because the current would swing the boat broadside to the seas as illustrated in figure 17.

Getting the boat up on the beach is a slightly dif-

ferent matter from beaching an LCP. Usually, the crew hops overboard as the whaleboat grounds, to both lighten her and guide her up the beach. Logs or old spars found on the beach can be put under the keel and used as rollers. The bow painter can be used as a pulling line after the rollers have been put in place. But don't use the painter before the

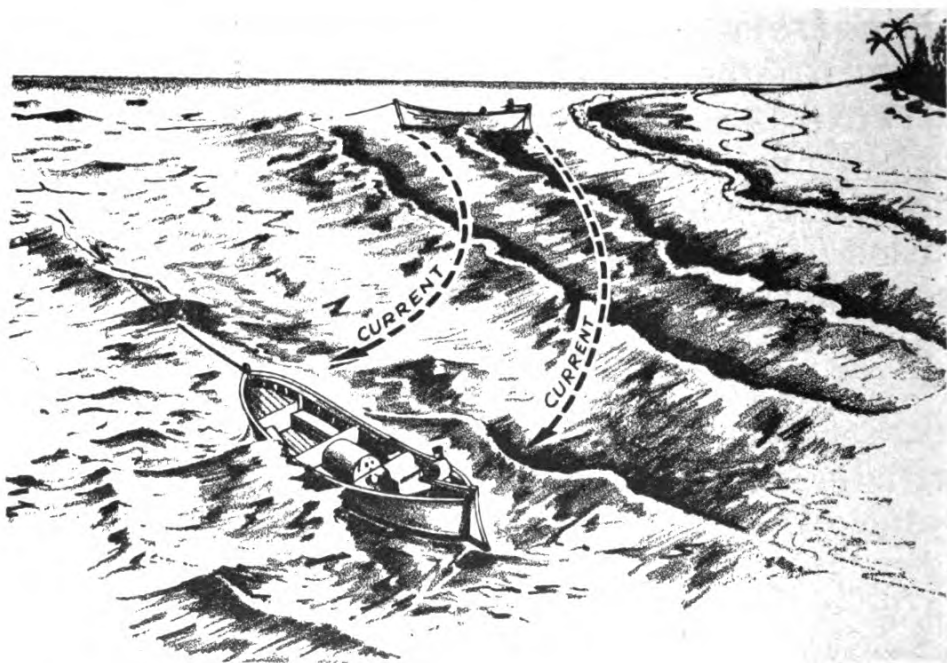
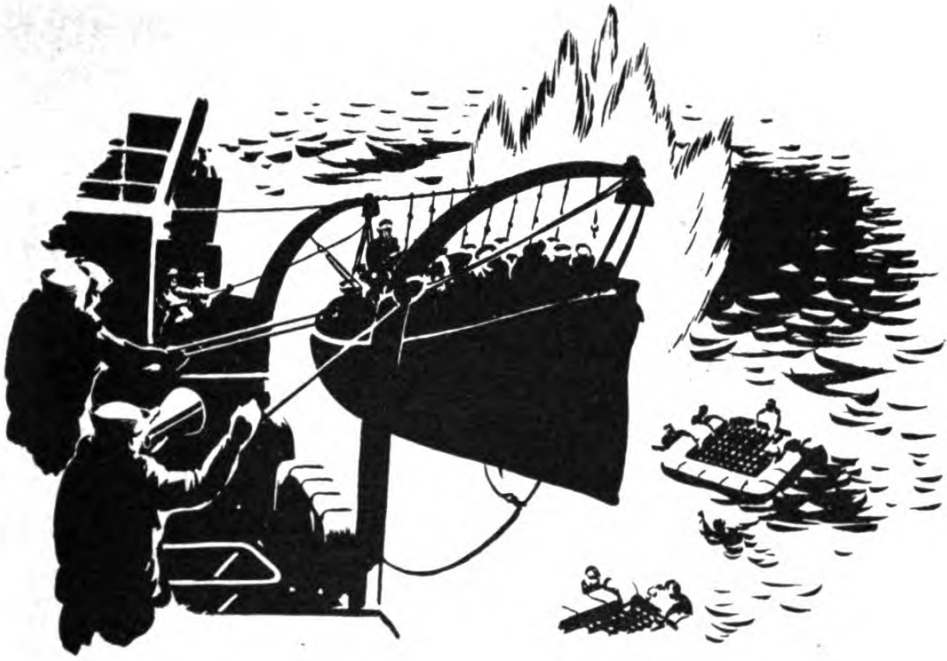


Figure 17.—Don't pull the anchor stunt when a strong current is running parallel to the beach. Here's what happens.

rollers are placed or you will drive the bow into the sand.

When retracting, keep enough headway so that the boat will ride up and over the waves and not be driven back on the beach.

To retract a pulling boat, the crew must really lean on the oars to get the boat moving as fast as possible. In a power boat, you must use enough power to combat the inrushing force of the seas but not so much power that the boat is driven into the waves instead of over them.



CHAPTER 3

BOATS AND FLOATS EQUIPPING AND PROVISIONING

Basil Dominic Izzi, 20 years old and a Seaman 1c in the United States Naval Reserve, spent 83 days on a life raft back in the winter of 1942-43 AND LIVED TO TELL THE TALE.

You remember his story. It made headlines for days. But, do you remember his telling how he and his two Dutch mates fished for sharks so that they could have food and drink?

THEY USED THEIR TOES FOR BAIT!

That's right. Their toes. A piece of line was used as a lasso with the noose laid on the water alongside the raft. The boys took turns holding their bare feet inside the noose. When Mr. Shark lunged for the toes (hurriedly yanked out of the water), the noose was pulled tight and there was food and drink on the table.

How was fishing? Well, the boys dined pretty exclusively on shark meat for quite a while. And, as Izzi puts it—

“No one lost a toe.”

The experience of Izzi and hundreds of other red-blooded American fighting men helped to speed the development of new equipment and provisions—things that are now found in Naval and merchant marine life floats and lifeboats.

The abandon ship equipment available for small boats in 1944 is much further advanced than it was when Izzi had to make a hurried exit from his torpedoed ship approximately two years before. And, improvements are being made every day!

Seamen don't have to use their big toes for bait any more. Look at that fishing kit worn by the Photographer's Mate in figure 18. Lures to attract the most finicky fish!

There's a new method for making sea water drinkable too. A portable still? Not by a long shot. Merely some desalting briquets and a plastic bag with drinking tube and neck cord. Here's all you have to do to turn salt water into drinking water—

Strap the kit to the raft and loop the bag around your neck. This secures the equipment and leaves your hands free. Fill the bag with sea water to the marked height and drop in a briquet. Now fold and strap the top of the bag to make a watertight closing. That's all.

A disrupting agent in the briquet causes it to break apart at once. The chemical particles thus released take up the bulk of the salts. Gentle kneading aids this desalting action. Solid particles are strained out by a cloth filter in the bottom of the bag as you drink the clear, potable water through the plastic drinking tube.

And so it goes. Naval researchers work night and day to “bring 'em back alive.”



Figure 18.—Navy's new emergency fishing kit.

ABANDON SHIP EQUIPMENT FOR SMALL BOATS

The allowance of abandon ship equipment listed here is in addition to the regular boat equipment tabulated further on. These are the life-saving items supplied small boats as of July 1944—

Wooden water BREAKERS.—Sufficient breakers allowed to provide minimum total allowance of 1 quart of water for each man of the boat's maximum carrying capacity.

Yellow BUNTING.—Three yards are issued for each boat. The bunting is used to attract the attention of passing surface craft and aircraft.

CUPS.—One 6-ounce cup is attached to each water breaker. These cups are graduated in ounces so that water can be measured accurately.

DYE.—One 12-ounce package of Fluoriscetin sodium salt dye is issued to each boat. This dye is used to color surrounding water to attract the attention of airplanes.

FLASHLIGHTS.—Two compact and waterproof flashlights are supplied to each boat.

FISHING KIT.—This United States Navy emergency fishing kit is packed in a hermetically sealed container which is opened with a key. The container is approximately $8\frac{3}{4}$ inches long and $5\frac{1}{2}$ inches in diameter.

MIRRORS.—These emergency signaling mirrors are 4×5 inches and have rounded corners. They weigh 8 ounces each.

PAULINS.—Two 7×8 foot boat paulins are issued to protect personnel from exposure and to catch rain water for drinking. If one paulin is part of regular boat equipment, only one will be issued as abandon ship equipment.

RATIONS.—Five days ration for each man are packed in oblong metal containers. The rations will provide each man with 1,000 calories per day.

FIRST AID KIT.—Bureau of Medicine and Surgery provides a compact kit containing all essential first aid supplies, including oil for treatment of legs and feet.

VERY'S PISTOL.—Bureau of Ordnance furnishes a Very's night signaling service box.

LIFE FLOATS AND FLOATER NETS

BREAKERS.—Wooden water breakers are issued as abandon ship equipment for life floats and floater nets on this basis—

CAPACITY OF FLOAT OR NET	ALLOWANCE OF BREAKERS
60 persons	3 five-gal. breakers
40 persons	2 five-gal. breakers
25 persons	2 three-gal. breakers
15 persons	1 five-gal. breaker
10 persons	1 three-gal. breaker

CUPS.—Two 6-ounce cups are allowed for each breaker.

FISHING KIT.—Same as for boats.



Figure 19.—Three well clad but cold looking men break out the rations on a life raft.

MIRRORS.—One issued to each float or net. They are the same size as those issued boats.

PADDLES.—Five-foot paddles are issued to floats only on the following basis—

Two for each float having a capacity of 25 persons or less.

Four for each float with a capacity of 40 persons.
Six for each float whose capacity is 60 persons.

PAINTERS.—One painter is issued for each float or net. Length of painter depends on size. They are used for towing the floats and nets after launching.

PAULINS.—Issued to life floats only, one to each float with a capacity of 25 or less and two to each float with a capacity greater than 25 persons.

RATIONS.—Three days ration for each man of the float's maximum carrying capacity.

MEDICAL KIT.—Same as issued to boats.

VERY'S KIT.—Also same as the one issued to boats.

REGULAR BOAT EQUIPMENT

War necessitates "clearing the decks for action." In wartime all combatant ships are practically stripped of their boats, and life saving equipment is limited to life floats and floater nets. In peacetime, however your ship will again have her full complement of boats and you will have to know the standard equipment which goes in each one.

The following tables list the equipment that is regularly placed aboard the ship's boats. In addition, there is a table showing the equipment required for three types of small landing craft.

TABLE 1

EQUIPMENT REQUIRED IN POWER BOATS

1. Anchor, with chain or line bent and ready for use.
2. Bow painter.
3. Stern fast.
4. One complete set of oars. Each oar must be fitted with a trailing line if the boat is equipped with swivel rowlocks or with tholepins and grommets, neither of which permits tossing.

5. Spare oars as described in the boat outfit list.
6. Boat hook.
7. Spare sails, blocks, rigging, spar cover, and sail bag.
8. Boat bucket for bailing and other uses.
9. One filled water breaker.
10. One set of stretchers.
11. One canvas bag containing a boat ensign and staff, one pair of semaphore flags and staffs, one answering pennant and staff, one boat distinguishing flag and staff.
12. Boat compass (when boat is in water only).
13. Tin box with cover (if there is no locker) for clean-gear.
14. Rudder and tiller, each fitted with a light lanyard.
15. Plug secured to keel by chain.
16. Full set of rowlocks and two spare ones, (if swivel rowlocks are used) each fitted with a short lanyard.
17. One set of boat fenders fitted with lanyards.
18. One deck lantern, if ship is to be absent from the ship after dark. Rules of the Road require that such a light be displayed by pulling boats whenever necessary to prevent collision.
19. Ring life buoy.
20. Steering oar and crutch.
21. Life jackets when rigged as lifeboats. A paulin and grapnel, fitted with short chain or line, are supplied as needed.

TABLE 2

EQUIPMENT REQUIRED IN PULLING BOATS

1. Anchor, with chain or line bent and ready for use.
2. Bow painter.
3. Stern fast.
4. Two oars with oarlocks, or grommets and tholepins. (When motor boat is to be on long trip or at abandon ship.)

5. Boat hooks.
6. Boat bucket.
7. Breaker of drinking water.
8. Canvas bag with boat ensign and staff, semaphore flags, answering pennant and boat distinguishing flag.
9. Boat compass.
10. Tin box and cover for cleaning gear.
11. Set of fenders fitted with lanyards.
12. Cushions and cushion covers. (Except for motor whaleboats and motor launches.)
13. Fuel, lubricating oil, waste etc.
14. Deck lantern, trimmed, filled and ready for use.
15. Tools for servicing of engine.
16. Two round life buoys, one forward, one aft.
17. Life jackets, readily accessible.
18. Running lights, foghorn, and bell as required by Rules of the Road.
19. Grapnel with short chain or line.
20. Bucket of sand for extinguishing gasoline fires.
21. Co₂ fire extinguishers. (Number varies according to size of boat.)
22. Paulin. (Except for 10 foot, 26 foot and 35 foot motorboats.)
23. Rudder and tiller. (Omit tiller in case of motorboats.)

TABLE 3

BOAT EQUIPMENT—LCVP, LCP(R), LCP(L)

DESCRIPTION	NUMBER
30 lb. Danforth anchor or equal	1
66 fathoms 3" anchor line	1
15 fathoms 21 thread grapnel line	1
Bow painter, 8 fathoms 3"	1
Bow painter, 5 fathoms 2½"	1
Stern fast, 8 fathoms 3"	1
Stern fast, 5 fathoms 2½"	1
Compass, mounted, semi-compensating	1

Compass, magnesyn	1
Fire extinguishers, hand; CO ₂ , 15 lb.	1
Fire extinguishers, fixed, CO ₂ , gasoline engines only, not on LCVP	1
Boat buckets	4
Side fenders, sennit, size A	4
Grapnel, 4 lb., fitted with 6' close link chain, not on LCP (R)	1
Boat hooks, 8 foot	2
Paulins, cockpit cover	1
Hand lantern, type J-1-S	1
Bilge pump, hand, standard Navy	2
Emergency tiller	1
Sounding rod, hardwood, fuel	1
Sling, hoisting	1
Blowers or bracket fans, not on LCVP	2
Deck key, if required	1
5 gallon water breaker	2
Buoys, life ring, Kapok	2
Flag bag with set of signal flags	1
Answering pennant, No. 6	1
Spare propellers	1
Spare propeller shafts	1
Spare strut bearings	1
Spare fuses, set	1
Spare lamps, set	1
Spare parts "per engine," set	1
Batteries, spare	1
Can, 5 gal., oil or water	2

¹ Provide spare trays in multiples of 4 equal to or greater than 25% of all trays in use.

HOISTING AND LOWERING BOATS

The equipment used to hoist small boats aboard a ship and to lower them away varies between the different classes of ships, but the manner in which

the boats are hoisted and lowered is pretty much the same in all cases.

On light craft and auxiliaries, boats are handled by booms or heavily-constructed davits. These are rigged so that the hauling part of the falls can be led to a winch.

The boats on aircraft carriers are stowed in boat pockets. They are hoisted and lowered by heavy power davits or cranes which are designed and located so that they can serve the boats and yet be clear of the side and of the flying deck when secured.

Specially designed quadrantal and radial-arm davits are arranged in pairs on some carriers. On others, boat cranes are located in the side of the ship between two adjacent pockets whose boats they serve.

Electric hoisting apparatus is almost always provided with magnetic brakes which hold the load when the controller is returned to neutral or when power is lost. Automatic limit switches prevent a TWO-BLOCK position when hoisting.

Most airplane crane hoisting apparatus includes a shock absorber installed in the whip—or in the sheave bearing at the head of the boom—to reduce sudden stresses.

Don't operate this hoisting apparatus recklessly simply because these safety devices are installed. They might fail when needed most and you would be responsible for damaging a boat or plane. Operate the crane carefully at all times.

Wire rope slings are used when hoisting boats. Fore and aft wire rope legs are shackled to chain bridles which, in turn, are shackled to hoisting pads on the keel. Manila rope SIDE GUYS, hitched to chain plates, are used to keep the boat upright. They ARE NOT intended to take any part of the weight of the boat when hoisting.

Motorboats handled by the crane have only three wire legs. Manila side guys are not used in this case.

On aircraft carriers which use davits to handle boats, the boats have two sets of slings—one set forward and one set aft—each being attached to its appropriate fall. Wire falls and ordinary hooks fitted with safety runners are used here. Each fall can be controlled independently.

Airplanes are provided with special slings.

RELEASING GEAR

The slings and crane blocks for hoisting large boats are heavy and unwieldy. Handling them in any kind of weather is difficult but handling them when the boat to be hoisted is pitching about in a rough sea is decidedly dangerous. SAFETY RUNNERS will make it much easier—and safer—for you to get the boat aboard.

A safety runner is a wire about $3\frac{1}{2}$ fathoms long which is made fast to the hook of the crane block. The wire has an eye worked in the free end and the standing part is attached to the point of the hook. A manila TRIPPING LINE is attached to the eye either by a snap hook or a hitch.

The tripping line leads from this eye to a block on the arm of the crane and then to the deck where it is belayed and the end coiled clear for running.

When lowering a boat, the ring of the slings is hooked on the crane hook and also in the bight of the safety runner. When the boat is in the water and the slings are slack, a man on deck pulls the tripping line. This straightens out the bight of the runner and lifts the ring out of the hook.

Assume now that the boat is returning to the ship. Assume also that the slings are not in the boat and the sea is calm enough so that the boat can be kept

under the crane without too much difficulty. In this situation, the slings can be lowered and the slings run onto the hook by a pull on the tripping line by the deck crew.

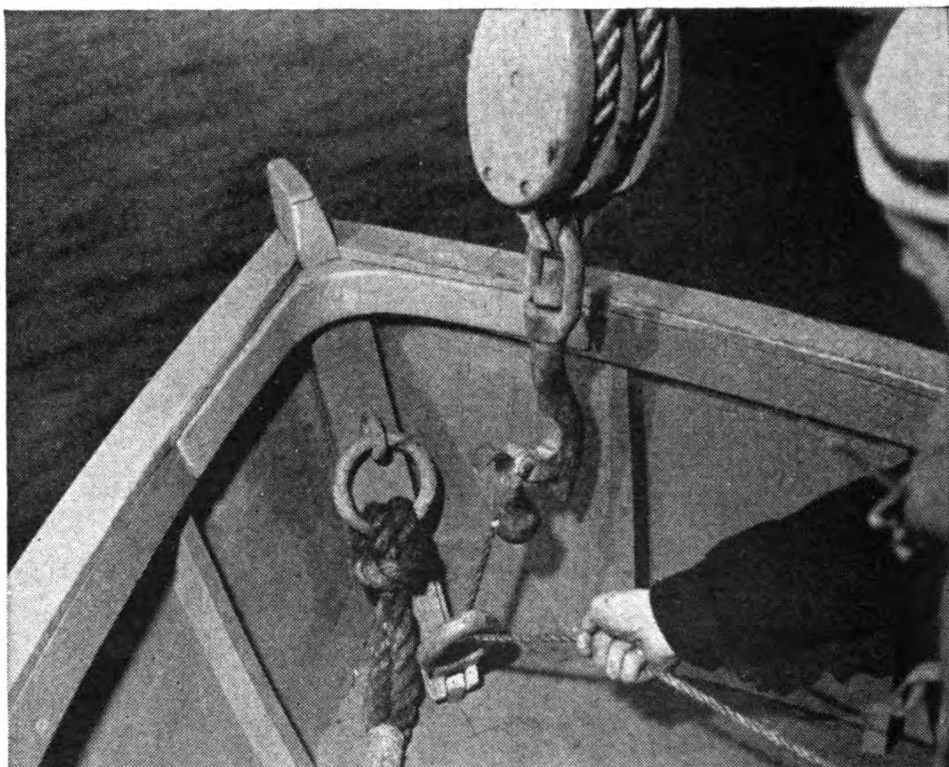


Figure 20.—A lanyard saves crushed hands.

If the boat is approaching the ship in rough weather, however, this procedure will have to be altered. The slings can be lowered in the bight of the runner as the boat comes under the crane, but the boat must move away from the side of the ship while the slings are attached. When the slings are secured, the boat comes under the crane again and the bight of the safety runner is let down and grabbed by the boat's crew where it is broken at the eye. The runner is then rove through the sling ring and the ring engaged to the crane hook by a pull on the tripping line as before.

When the command is given to lower a lifeboat, men's lives may be at stake. Speed, as well as skill,

is necessary on your part, and on the part of the men assigned to the lifeboat watch. There's no time to spend in stationing and instructing your men or in checking equipment.

LOWERING A PULLING BOAT—

At the call "MAN OVERBOARD"—given orally or on the bugle—every member of the lifeboat crew of the watch goes to his station on the double. In most cases, it is the lee lifeboat that is manned. If there is any doubt as to which lifeboat is to be



Figure 21.—It's "Man Overboard" and the motor whaleboat is called away. Note that the ship has begun to circle while the lifeboat is being lowered. This action took place aboard a submarine tender.

lowered, the officer of the deck indicates the proper one by the command—

"CLEAR AWAY THE STARBOARD LIFEBOAT," or—
"CLEAR AWAY THE PORT LIFEBOAT."

The men take their seats on the thwarts, put on

life jackets, get their oars ready, and then, if free to do so, each man seizes a life line in the event that there is an accident in lowering the boat.

When the boat is manned properly, the O.O.D., or the officer in charge of the lowering, commands—

“LOWER AWAY TOGETHER.”

The bow and stroke oars tend the falls to keep them clear and to prevent the blocks from striking other members of the crew when let go. FRAPPING LINES are used to keep the boat from swinging and to hold it close into the side as it is lowered. These lines are passed around the falls with ends leading inboard, as shown in figure 22.

On some ships, jackstays with TRAVELING LIZARDS are fitted from the davit head to the side of the ship. (Also shown in fig. 22.) A turn of the lizard is taken under a thwart or around the standing part of the fall. Never secure the lizard in the boat so that it can jam. After taking the turn around the thwart or falls, hold the end in your hand.

Some of the crew in the waist should breast the boat off the ship's side with boat hooks or oars. In doing this, however, they must make sure that the butt ends are held ABOVE the outboard gunwale so that a swing of the boat cannot drive them through the boat's side.

When the boat is a short distance from the water, the detaching apparatus is let go at the command from the boat officer or coxswain. If the boat is not fitted with the detaching apparatus, it is allowed to hit the water at which time the boat officer or coxswain commands—

“LET GO THE AFTER FALL.” Then, “LET GO THE FORWARD FALL.”

If the boat is fitted with detaching apparatus, the falls are released simultaneously when the detaching lever is pulled at the command “Let Go”.

This is the ticklish part of the operation, and the coxswain must work to keep the boat from being dashed against the ship's side. In doing this, he shears the stern in (and, consequently, the bow out) with the steering oar or rudder. When clear of the

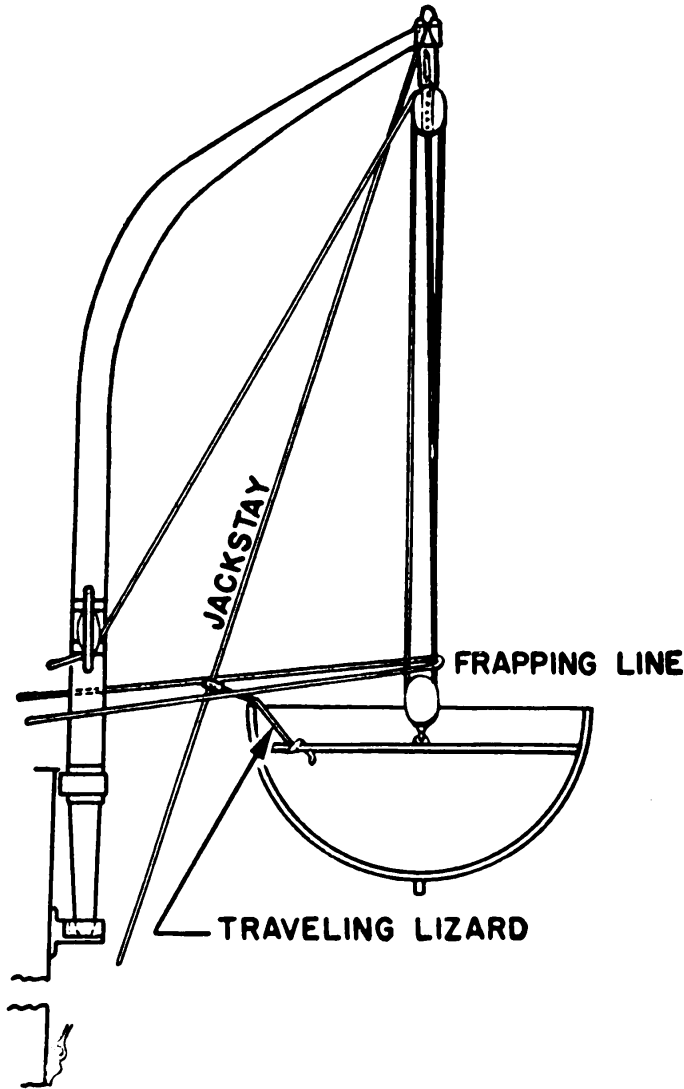


Figure 22.—Use of frapping lines and traveling lizard.

ship's side, the boat officer or coxswain directs the second bowman to cast off the sea painter. Thwarts-men get out their oars as soon as possible and the boat makes its way to the rescue.

LOWERING A MOTOR WHALEBOAT—

Cranes aboard ship are always in readiness to

put a motor whaleboat over when it is called away. Power to operate the cranes is maintained at all times while at sea and the cranes are inspected hourly. The crew of a motor whaleboat usually consists of the coxswain, an engineer, and bowman. If an officer is not on hand to take charge, it is desirable to have an extra man in the boat's crew to handle lines and to hook on.

The Boatswain's Mate on watch on the upper deck takes charge of the lowering until relieved by a chief Boatswain's Mate or Boatswain. The Officer of the deck orders the motor whaleboat hoisted out.

The crane takes a strain on the slings as the operation is begun. Gripes are released, steady lines are manned, and the boat is hoisted and swung out. The slack of the sea painter is taken in as the boat is swung out and the boat, with engine running, is lowered to a point at which it is just clear of the water.

When all is ready, it is lowered quickly into the water, the slings are tripped from the crane hook, and the steady lines are released. The boat shears away from the ship's side as the sea painter is released—under way at last.

HOOKING ON AND HOISTING

Men on deck should be ready and waiting as a boat approaches the side to be hoisted aboard. All necessary lines must be manned, fenders rigged over the side and a sufficient number of men standing by the falls.

If the ship has way on, the boat is passed a sea painter as it approaches the ship. The painter is grabbed by the bowman in the boat and a turn taken around the forward thwart. Bow and stern lines are then passed and the boat is hauled under the crane or davits.

HOOKING ON requires a good deal of skill and an equal amount of common sense. It is impossible to establish a set of rules that you can follow.

Paramount consideration is to handle the hook without getting a crushed hand and that brings up the question as to whether it is most advisable for the point of the hook to point towards the center

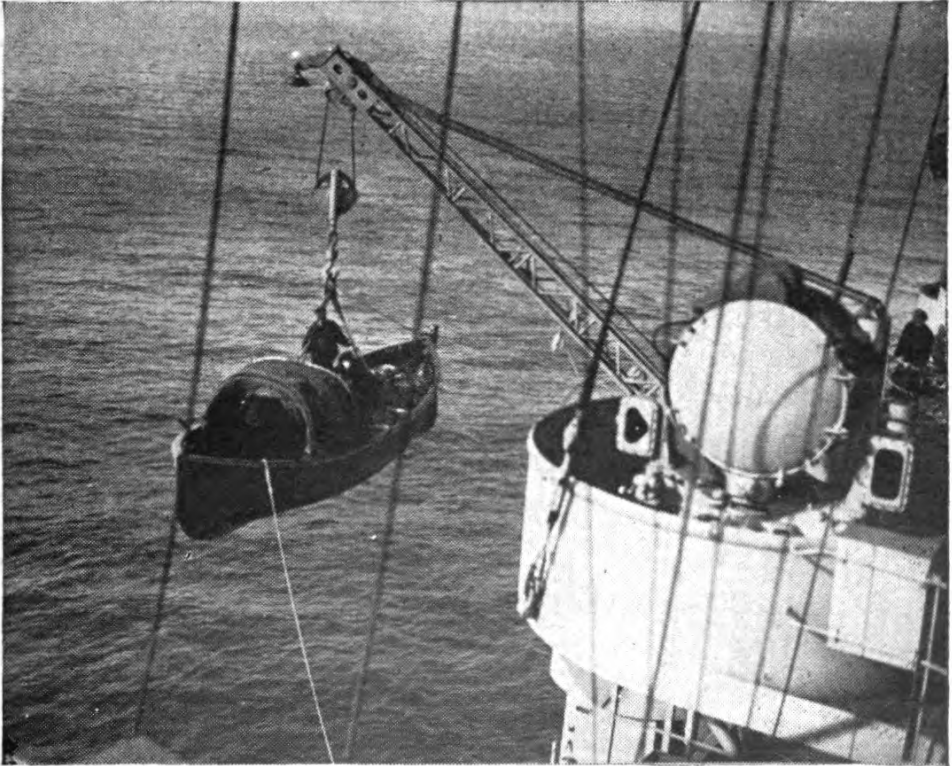


Figure 23.—Hoisting whaleboat aboard the USS DENVER.

of the boat or away from it.

That question is answered by the conditions involved with particular emphasis on the space in which the man must work.

If slings are used to hoist the boat, the design of the slings will indicate the proper method to be used. The angle of inclination, for instance, will have an important bearing on your decision.

If falls are used, you'll find that the block is fitted either with an automatic releasing type hook or with a simple hook.

When an automatic releasing hook is used on the boat falls of a small boat, the hook is hauled into the hoisting ring and hooked on with the aid of a lanyard.

In most boats, it is both convenient and safe for the man hooking on the falls to stand toward the center of the boat from the falls and haul the lanyard and point of the hook toward him. (See figure 20 again.) The use of the lanyard eliminates any danger of the block falling on the man's hand because the lanyard can be rove through the ring in the boat while the block is at a safe distance from him.

Therefore, when an AUTOMATIC RELEASING HOOK IS USED the point of the hook can be pointed TOWARD THE CENTER of the boat.

When the simple hook is used, conditions involved must determine the method to be used.

If there is a limited space between the ring and the sides of the boat, it would be extremely dangerous to attempt hooking on with the point of the hook toward the center of the boat. The man handling the hook would have to place his hand in a confined space and his chances of getting it out of there unmangled would not be good.

Therefore, the point of the hook would face AWAY FROM the center of the boat.

HOISTING—Once the hooks have been attached, the boat is hoisted to the deck with the aid of the same equipment and tactics used in lowering. Steadying lines, frapping lines, the traveling lizard, and men with boat hooks, are all employed to keep the boat from swinging against the ship's side as it is hoisted. Always hook on the forward falls first.

If the ship has considerable way on, a line should be led from the stern of the boat to a point well aft on the ship so that the boat will not lurch forward

when it leaves the water. When the boat is being hoisted with falls and by man power, the men should run away with the falls as the ship rolls toward the boat. When a winch is used with the falls, the falls are taken around the barrel of the winch. The

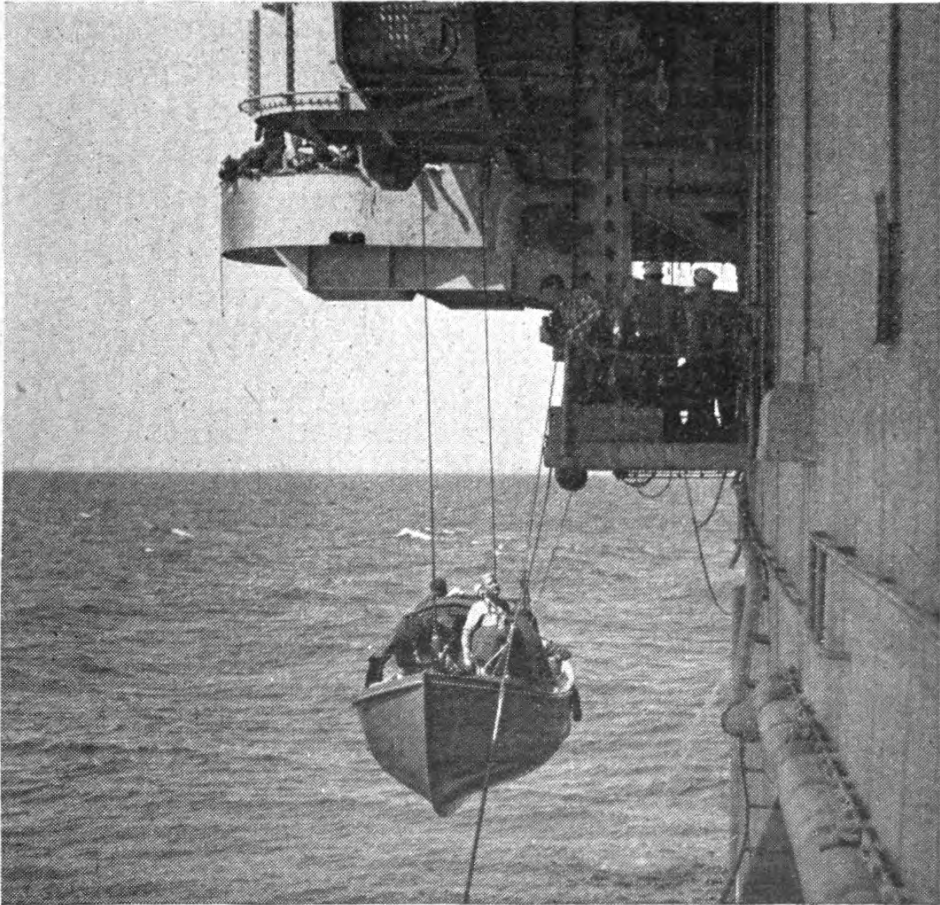


Figure 24.—A motor whaleboat is hoisted aboard the USS COWPENS.

winch should be turning at the proper speed before the order “HAUL TAUT” is given.

FOUL WEATHER

Heavy seas and a strong gale put a boat crew's seamanship to a real test when a boat must be lowered away or hoisted aboard. Procedures are basically the same except that the accent is even more on perfect timing and good judgment. Also, you can

employ a few tricks to foil old man weather's attempt to make kindling wood of the boat.

LOWERING IN HEAVY WEATHER

In LOWERING, heavy steadying lines are secured to the bow and stern of the boat and are tended by able men on deck. The safety runner is rigged, and you're ready to go.

The boat is lowered until just clear of the water and checked there until conditions allow it to be lowered the rest of the way. Once the boat is water borne, the ring of the sling is run clear of the hook by a pull on the safety runner and the crew takes her away smartly.

Steadying lines are also used on the crane block when the ship is rolling or pitching.

The boat's engine should be running before the boat hits the water.

Round fenders should be hung over the bow and quarter of the boat.

HOISTING IN HEAVY WEATHER

When all HOISTING preparations have been made, including hanging the slings from the bight of the safety runner, the boat is worked up under the crane, the bow line, stern line, and steadying line passed, and the crane block lowered. The slings hang slack in the bight of the runner while the legs are shackled to the boat's hoisting chain bridle.

When you are using a crane or boom to hoist a boat from a seaway, you will probably encounter three difficult situations—

FIRST—after the boat has been hooked on and you have started to hoist away, the boat may crash into the water again as the ship rolls, resulting in a violent jerk which is destructive to the hoisting gear.

The best way to avoid this is to time your actions with the seas. When the ship begins to roll towards the boat or when the ship is on a high wave, lower the crane block quickly. Just as quickly, see that the ring of the slings is run onto the crane hook by the safety runner and start hoisting.

SECOND—the ship's rolling may cause the boat to swing into the side of the ship as it is being hoisted. You can prevent this with the use of stout steadying lines, forward and aft, and the placement of fenders over the side. The lines should be tended so that the slack is taken in or held as the boat starts to swing.

When the boat is making headway through the water or the ship is pitching badly, long bow and stern lines should be used to reduce fore and aft surge as the boat is hoisted.

THIRD—once the boat has been hoisted and swung in, it is sometimes difficult to plumb the boat's stowage long enough to lower the boat into place. Steadying lines are a necessity in this case, and particularly when the boat stows close to the ship's side, it is desirable to use four of them—two forward and two aft. These lines should lead from opposite sides of the boat at the bow and stern so that they cross and thus give a better lead for steadying the boat into position as it is lowered.

Both the lowering and hoisting operations in bad weather are made easier when the ship creates a lee before the boat is put overboard or picked up. This is usually accomplished from the bridge by swinging the ship to a new course which is at right angles to her old one. Oil can also be released to form a slick.

Turning back to page 55, note that the ship has begun to circle as the boat is made ready. Visible traces of the wake show how the lee is made.

HANDLING AIRCRAFT

HANDLE WITH CARE!—That's the password when you and your men are hoisting an airplane aboard ship. It's a very simple thing to damage an airplane while getting it from the water to the deck. The

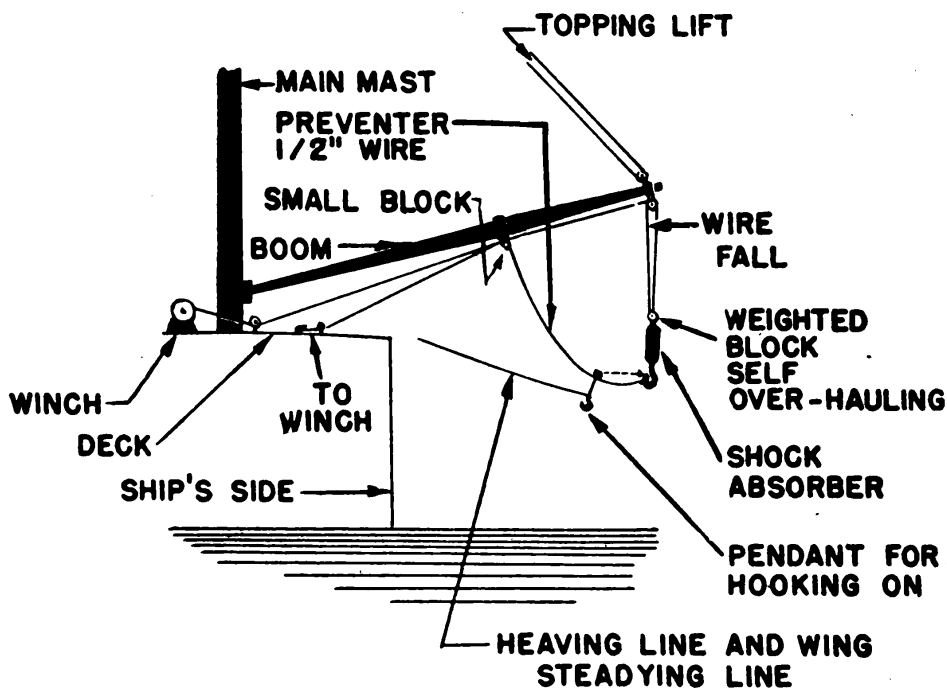


Figure 25.—Sketch of boom used for hoisting planes on a 7,500 ton cruiser.

plane must be prevented from swinging against the side of the ship. Wing steadying lines are used for this purpose aided by members of deck crew with bamboo fending-off poles.

All large ships are equipped with special airplane cranes that are designed for speedy handling and delicate control. A typical boom and winch arrangement for hoisting planes is shown in figure 25.

You'll find that the planes you must work with are equipped with bridles which permit the planes to be lifted bodily by the crane or davit. Once on

deck, the planes are moved on special trucks built to hold them securely. Thus, the plane can easily be hoisted aboard ship, placed on the truck, rolled to a position under a boat crane and hoisted to the catapult.

HANDLING WEIGHTS

In addition to handling boats and airplanes aboard ship, you must move all types of heavy cargo and other weights aboard the ship, off the ship, and about the ship. You'll use seven different kinds of tackles in doing this.

SINGLE WHIP—This is the simplest form of tackle consisting solely of a rope rove through a **STATIONARY** block. Use of this tackle will give you a better lead but does not increase the power. The pull is the same as the weight. See *A* in figure 26.

RUNNER—The runner is a single **MOVABLE** block fitted with a hook. One end of the line is made fast

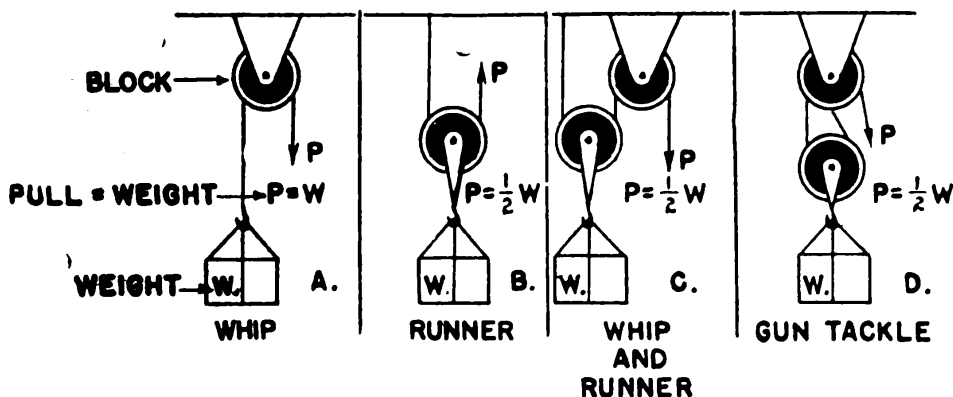


Figure 26.—Single whip, runner, whip runner, gun tackle purchase.

and the other is the hauling end. With this tackle, the pull is equal to half the weight lifted. *B* in figure 26.

WHIP RUNNER—This tackle is a combination of the first two. Pull equals half the weight. *C* in figure 26.

GUN-TACKLE PURCHASE—This tackle is composed of two single blocks arranged as shown in *D* of figure 26. Here again, the pull is one half of the weight being lifted.

LUFF TACKLE—This is sometimes called a jigger. It consists of a double and a single block. The stand-

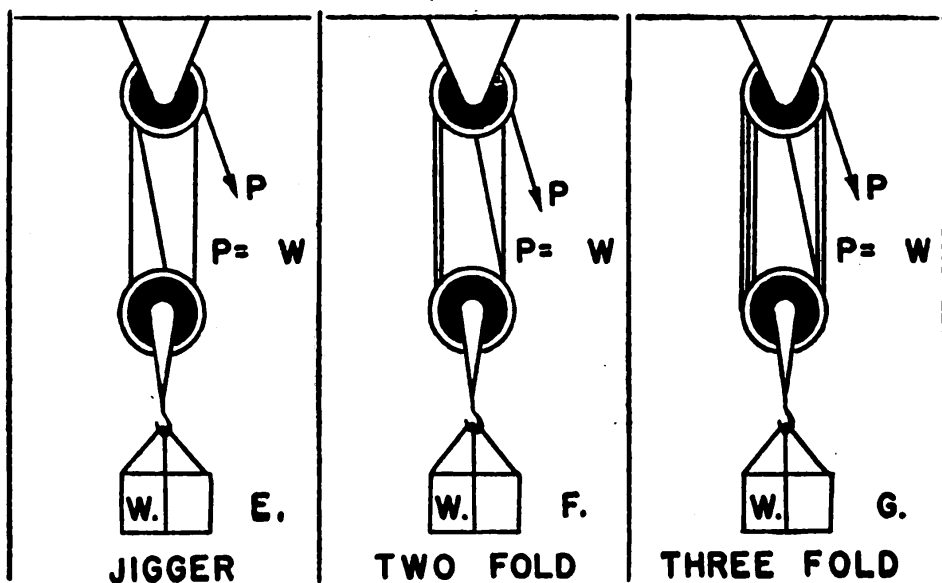


Figure 27.—Luff tackle, twofold and threefold purchases.

ing part is made fast to the single block and pull is one-third of the weight lifted. *A* in figure 27.

TWOFOLD PURCHASE—This one has two double blocks. The standing part is made fast to the block that the hauling part comes from. The twofold purchase is used for boat falls and gives you a pull that is only one-fourth the weight lifted. *B* in figure 27.

THREEFOLD PURCHASE—Consists of two triple blocks and is the heaviest tackle found aboard ship. It is used for handling ground tackle and other heavy weights. The pull is only one-sixth the weight lifted. The standing part is made fast to the block that the hauling part comes from. *C* in figure 27.

There are other tackles but they are all combinations of the seven basic tackles just described.

Weights should always be lowered and hoisted smoothly. Sudden jerks on the line and abrupt changes in speed affect the ratio of the pull to the weight. For example: You are hoisting a box weighing 100 pounds at a speed of 10 feet per second. All of a sudden, mess call starts a scramble for chow, and you start pulling at the rate of 20 feet per second. Now, instead of handling a weight of 100 pounds, you are theoretically lifting one that weighs 162 pounds.

This puts a severe and unnecessary strain on the tackle and might mean trouble. The same thing applies when you bring a weight being lowered to a sudden stop.

PATENT CHAIN HOISTS

Various types of patent chain hoists (mechanical purchases) are probably used aboard your ship. These chain hoists are classified according to the weight they are built to handle, and their main advantage lies in the fact that one man can handle the maximum load on any one of them.

And "one manpower," incidentally, is all the force that should be exerted on one hoist. Don't figure on putting two men on a hoist designed for 200 pounds so that you can raise 400 pounds. It won't work. The hook will probably spread or the lifting chain will part and your popularity rating aboard ship will be double zero.



CHAPTER 4

DECK SEAMANSHIP

SPICES, TACKLE, CANVAS

Knots, splices, and all manner of fancy rope work are a traditional part of the sailor's trade. While high speed steam turbines and Diesel engines have made rope and canvas somewhat less important in everyday life at sea, a good splice plays just as vital a role in modern seamanship as it did in the days of sail.

As a Coxswain, you've learned to splice fibre rope and that knowledge now qualifies you to tackle the splicing of wire rope—admittedly more difficult.

SPlicing WIRE ROPE

You'll use these tools for all splicing work ordinarily done aboard ship—

Rigger's screw, or vise.
Wire cutters.
Two marline spikes.
Pricker.
Hammer.
Light deck tackle (Jigger).
Two selvagee straps.

Wire rope is usually six-stranded with a hemp center. When splicing it, you will work with individual strands or with pairs of strands. Pairs of

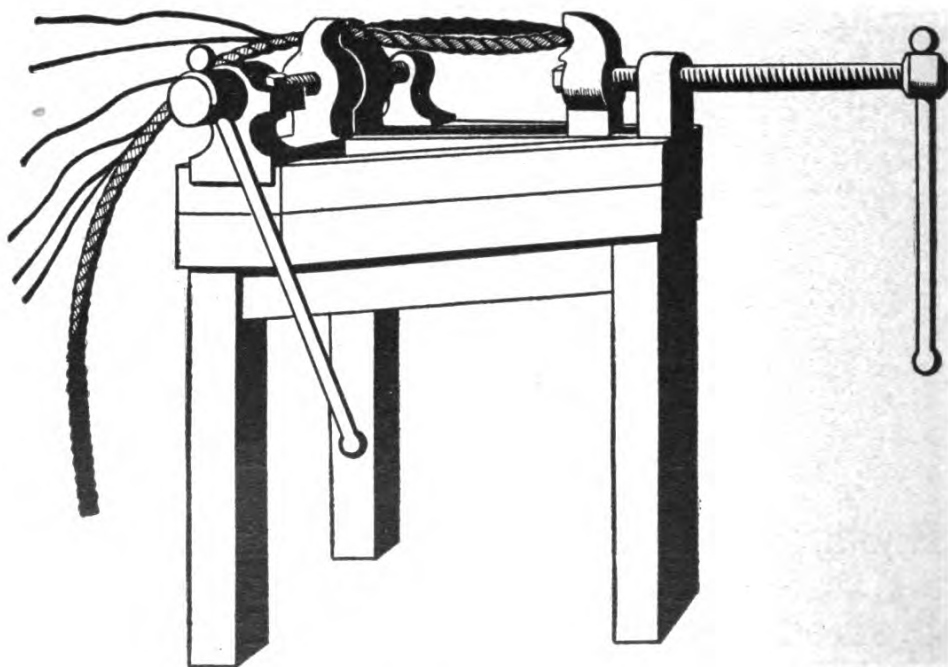


Figure 28.—The rigger's screw.

strands, however, are used only when making a long splice.

Before you cut wire rope, whip it on each side of the point at which it is to be cut. After you have made the cut, put on a good serving where the splice is to begin, and whip each strand separately. Most types of wire are WILD and will get out of hand easily.

In tucking the strands of a splice, the lay of the rope is opened out and the spike left in to hold the strands apart until the tuck has been made. Strands are hauled through with a JIGGER, and the body of the rope is held down by another jigger or by a lashing. After a tuck is made, the parts of the rope are hammered down tightly upon each other.

EYE SPLICE —

Get the rope on a stretch, allow from 18 to 24 inches for splicing and put on a mark with a couple of turns of twine. From this mark, measure along the rope and mark the length of the eye with another

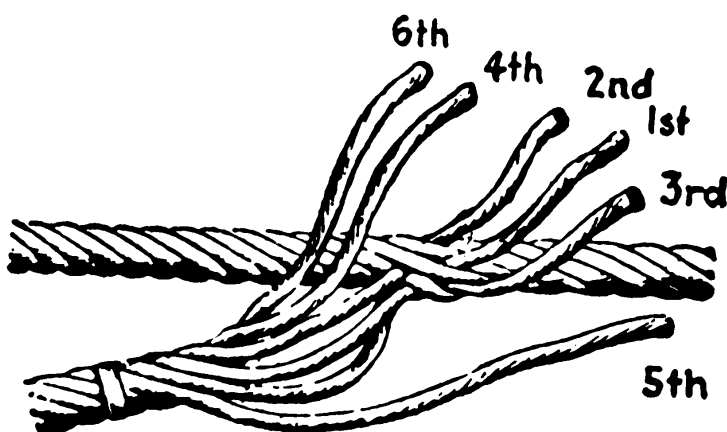


Figure 29.—The eye splice.

piece of twine. (Length is one and one-half the round of the thimble.) Paint with red lead, worm, parcel, paint again and double-serve between the marks.

Now come up the stretch and seize the thimble in, breaking the wire into the shape of the thimble, heaving both parts together with a rigging screw, unlay the end of the wire, and cut the heart out close to the service.

Now, with the thimble toward you, counting from right to left (1, 2, 3, etc.) tuck No. 4 strand from right to left under the two upper strands of the

rope just clear of the service, opening the strands with a spike. Haul through by hand.

In the same manner, tuck the remaining strands under two strands in this order: 3, 5, 2, 6, 1. Now, beginning with any strands, tuck the whole strands over one and under one and haul through with a jigger.

Hammer the strands in place, reduce each strand down to two-thirds size and tuck again, using the jigger to haul them through. Reduce the strands down to one-third and tuck again. Hammer down all strands and trim the ends with a wire cutter.

SHORT SPLICE—

Put on a good seizing 2 or 3 feet—according to the size of the rope—from the end of one rope and



Figure 30.—Short splice.

1 to 2 feet from the end of the other. Unlay the ends and open out the strands, cutting out the heart close to the seizings. Marry them and put on a temporary seizing around the short ends and the body of the rope to hold the parts together.

Beginning with any one of the long strands, tuck each in succession over one and under two strands, opening out the lay with a spike. Tuck the remaining strands in the same manner. Tuck the whole strands twice, the half strands once, and the one-quarter strands once. Haul through with a jigger each time.

Then turn the splice around, cut the temporary

seizing on the short ends and tuck the short strands once one-half and once one-quarter, hauling them through with the jigger. Hammer down all parts and trim with the wire cutter.

LONG SPLICE—

Put on a good seizing 6 to 10 feet—again according to the size of the wire rope—from the end of one rope and 1 to 2 feet from the end of the other. Unlay the ends and open out the strands, cutting out the

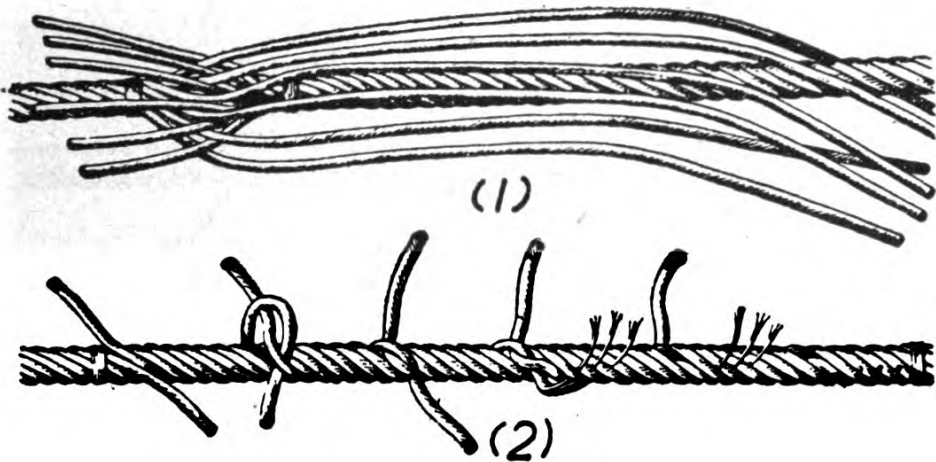


Figure 31.—Making a long splice, tucking each strand separately.

heart close to the seizings. Marry the ends together with strands interlacing. Cut the seizing on the short end. Unlay one of the short strands, following it up in the same lay with the opposite long strand, leaving end enough to tuck.

Continue in the same manner with the remaining strands, except as to the distance they are laid up. This distance is varied so as to leave the successive pairs an equal distance apart.

Starting with any two strands, half knot them together (full size) then divide each into three parts and tuck these parts separately. Or, cut out a few inches of the center and insert the ends of the

strands in place in the center of the rope. When a splice is to be served, the latter way of finishing it off answers very well.

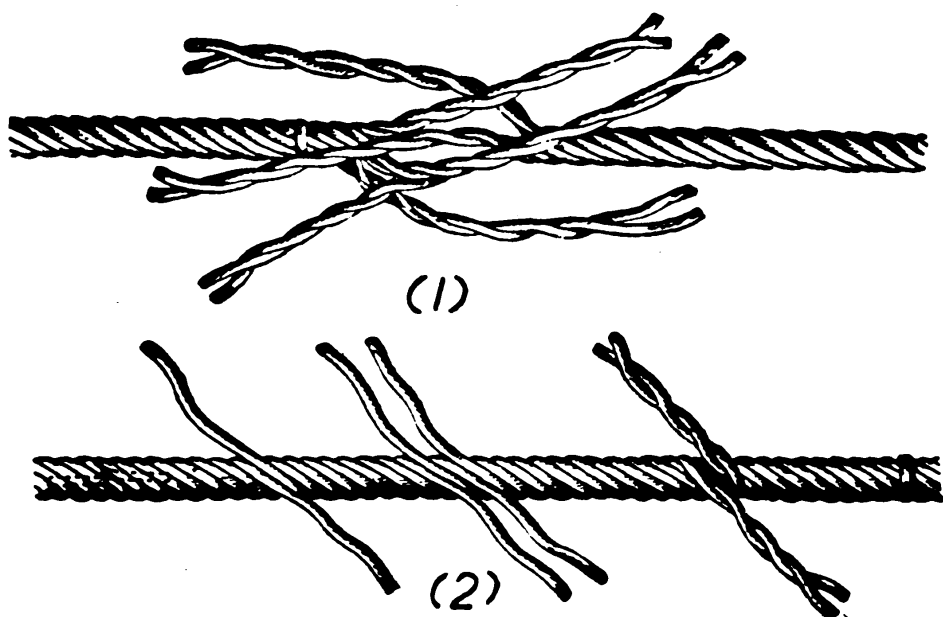


Figure 32.—The long splice, tucking pairs of strands.

GUN FACTORY SPLICE—

Another type of splice suitable for work aboard ship is the “gun factory splice”—so called because it is used for the handling of guns and ordnance material.

To secure an eye in the end of a 6-strand wire rope by this method, you seize the wire about 2 feet from the end to prevent unraveling and whip each of the six strands as usual.

Then, having determined the size of the eye, No. 1 strand (counting from right to left as you did in making the standard eye splice) is tucked from LEFT to RIGHT under THREE strands of rope, but not under the heart of the rope.

Next No. 2 strand is tucked from left to right under TWO strands, entering the rope at the same place strand No. 1 entered. Number 3 strand is then

tucked from left to right under ONE strand, entering the rope at the same place as strands 1 and 2. Number 4, 5, and 6 strands are now tucked in succession, going OVER a strand and then tucking from left to right UNDER the same strand. This completes the first tuck.

The second complete tuck is made by tucking each of the six strands, going over and then under one with each strand, tucking from left to right and always moving around the rope to the left. A third complete tuck duplicates the second and normally completes the splice. Individual strands can be reduced in size on the second and third complete tucks if a tapered splice is desired for the sake of appearance.

TIME OUT—SUBSTITUTION

Splicing wire rope is definitely not child's play.

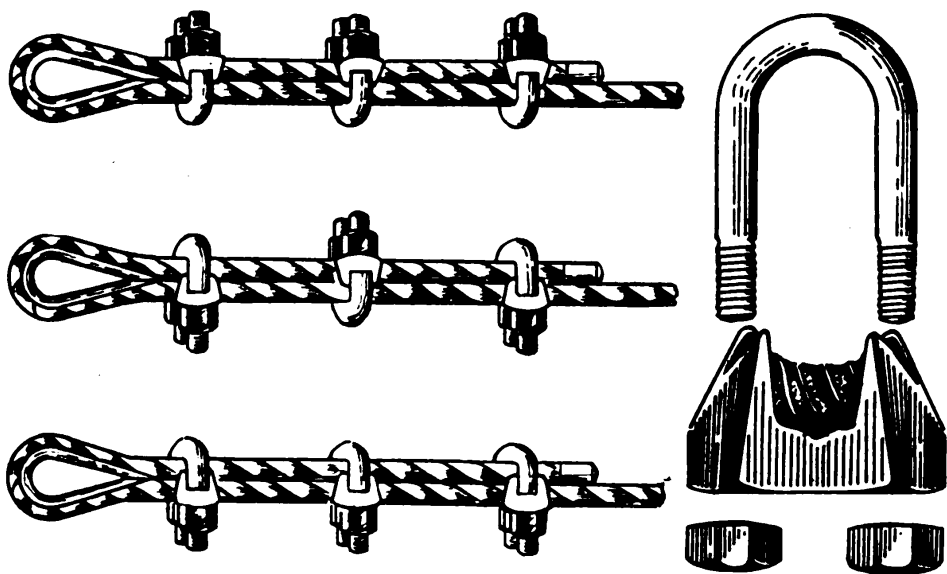


Figure 33.—Wire clip, right. Incorrect use, top and center. Correct use, bottom left.

What's more, it's a job that takes considerable time in addition to considerable skill.

When you have to put an eye in a piece of wire rope and you're in a hurry, the chances are 100 to 1 that you'll use a WIRE ROPE CLIP.

A wire rope clip is merely a U-bolt and base. The base is sometimes called a RODDLE. There is only one correct method of attaching these clips to wire rope. The roddle of each clip should bear against the LIVE, or long, rope end and the U-bolt should bear against the DEAD, OR SHORT, END. See figure 33.

Reason? Simple. Most strain is applied to the live end of the loop. Also, the U-bolt has less bearing surface than the roddle. If the clips are installed incorrectly, they will cause shearing, excessive wear and breakage.

The clips should be spaced at least six rope diameters apart for greatest holding power. After the rope is put in service and is under tension, the nuts should be retightened to compensate for decrease in rope diameter caused by the load.

OVERHAULING GROUND TACKLE

A visit to a Navy yard provides the opportunity to overhaul all ground tackle much more easily and thoroughly than can be done aboard ship. Anchors, chain cable and shackles can be given the once-over and put in A-1 shape.

When a ship puts in to a Navy yard, you can bet your bottom dollar the Bosun will see to it that the Navy regulation which states, "The Boatswain shall satisfy himself that the ground tackle is always ready for use and in good condition" is complied with.

And you, as one of his mates, will probably get the job of seeing to it that things are done properly. Your working party is very likely to be assigned to inspecting all anchors and cable and putting them in first class order.

Anchor cable is usually laid out in the drydock or on deck and inspected carefully. If necessary, the cable should be scaled of rust and painted. "Shots" of chain should be shifted to new positions to insure even wear throughout the length of the cable.

Anchor chain is usually marked by turns of wire on the studs of links and by painting certain links. These marks must also be inspected and fixed.

At the 20 fathom mark, the first studded link on each side of the shackle has ONE turn of wire around its stud and is painted white.

At 35 fathoms, the second studded link on each side of the shackle has TWO turns of wire around its stud and the two links on either side of the shackle are painted white.

At 50 fathoms, the third studded link on each side of the shackle has THREE turns of wire and the three links on either side of the shackle are painted white. The markings continue in the same fashion.

Some ships alternate red paint with the white. At 20 fathoms, the paint is red, white at 35, red at 50, and so forth.

ALTERNATE METHOD

Another way of distinguishing fathom markers is to paint the shackles red, white and blue. In this case, the 20 fathom shackle would be red; the 35 fathom shackle, white; the 50 fathom shackle, blue; the 65 fathom shackle, red, etc. When this system is used, all links between the 140 fathoms and 155 fathoms markers are painted yellow and all links between the 155 and 170 fathoms markers are painted red. Links are black up to the 140 fathoms marker.

Note, though, that this painting system does not include those links painted white as just described. They STAY WHITE.

PALM AND NEEDLE

The Bureau of Naval Personnel requires that you “demonstrate ability to make a canvas article required on board ship” before advancing to the rate of Boatswain’s Mate second class.

Seafaring men have had to be handy with needle and thread—and with palm and needle—for centuries. Even the tough, swashbuckling pirates of

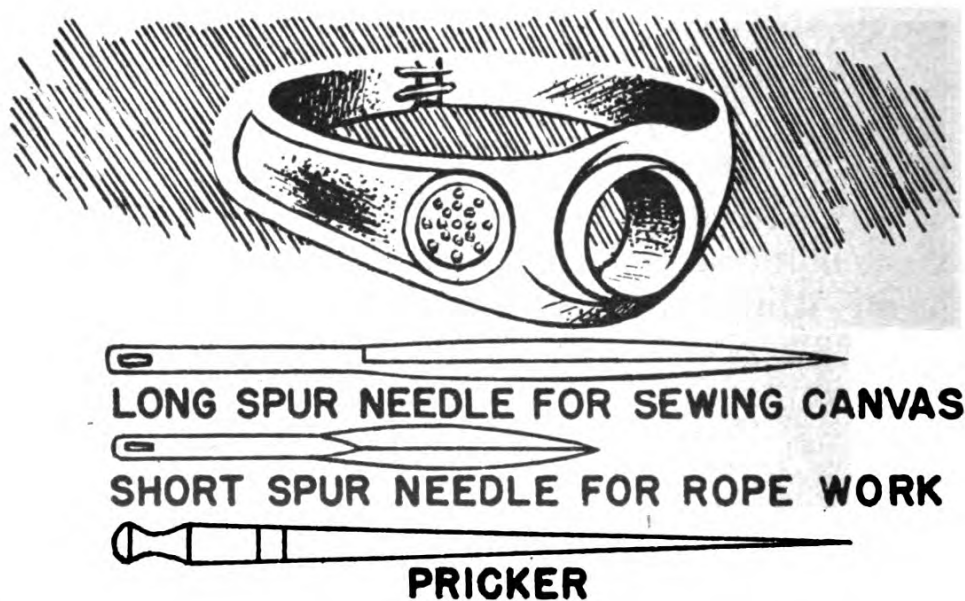


Figure 34.—Nautical sewing instruments.

the olden days who were anything but sissies spent many of their working hours repairing the ship’s canvas and many of their spare hours sewing clothes.

As a Navy coxswain for the past few years, you’ve undoubtedly learned to handle the palm and needle with the skill of an old sailmaker. You’ve probably even been called upon to teach your men the palm and needle technique.

So, THAT particular part of your exam is going to be a snap.

What canvas article are you going to make to prove your ability? How about a new cover for that small boat which took such a beating in the last big blow?

First, what weight canvas to use? Correct, No. 8 Now for the cutting. Will you cut it larger than necessary? Smaller than necessary? Same size?

Remember these rules?

When measuring canvas for use where it will be stretched taut (example: awnings) you DEDUCT $\frac{1}{2}$ inch for each linear foot of length.

When measuring canvas for purposes where it will be loose (example: boat covers) ADD $\frac{1}{2}$ inch to the length.

That answers that question easily enough.

You really won't have to bother with all that measuring however. Chances are good that the old cover is still around and you can use it as a guide. Even if it isn't, you can use the cover from another boat of the same size for your pattern.

Well, that's progress without wasted effort. Nothing to bother about now. Or, is there?

How about the stitching? What stitch will you use?

THE HERRINGBONE STITCH?

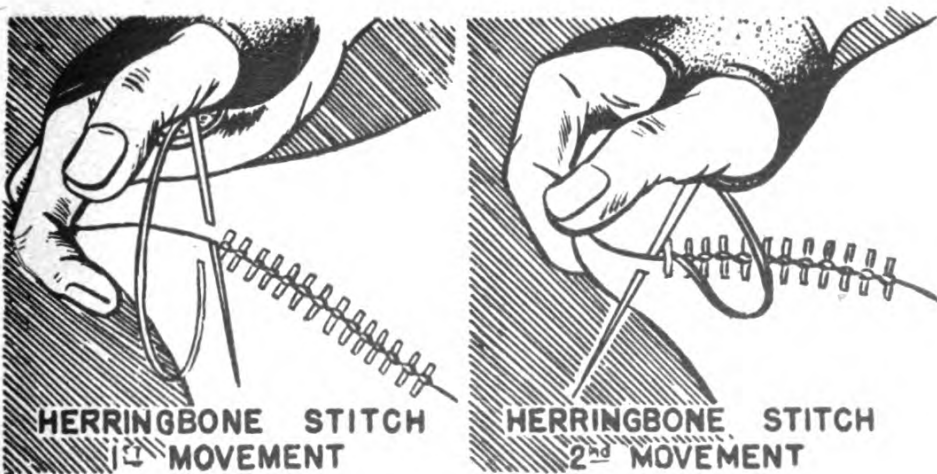


Figure 35.—The herringbone stitch.

Nope! You use that only when working with very heavy canvas, 00 to 3 weight, canvas that has been painted, when sewing leather, or when covering rope or wire.

THE ROUND STITCH?

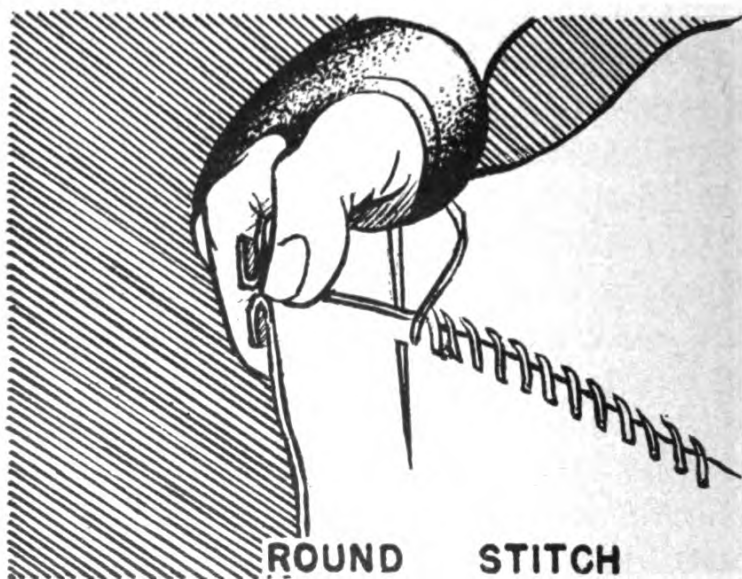


Figure 36.—The round stitch.

Answer is still no! You use the round stitch for such objects as a sea bag or fender cover.

THE BASEBALL STITCH?

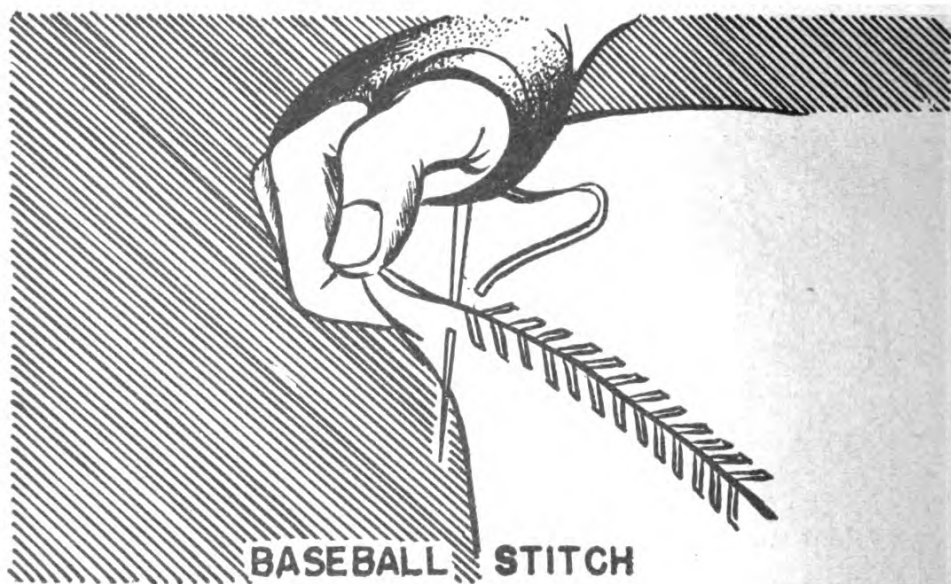


Figure 37.—The baseball stitch.

No! The baseball stitch is used where a real snug fit is required, such as repairing a rip in an awning. You'd use the—
FLAT STITCH.

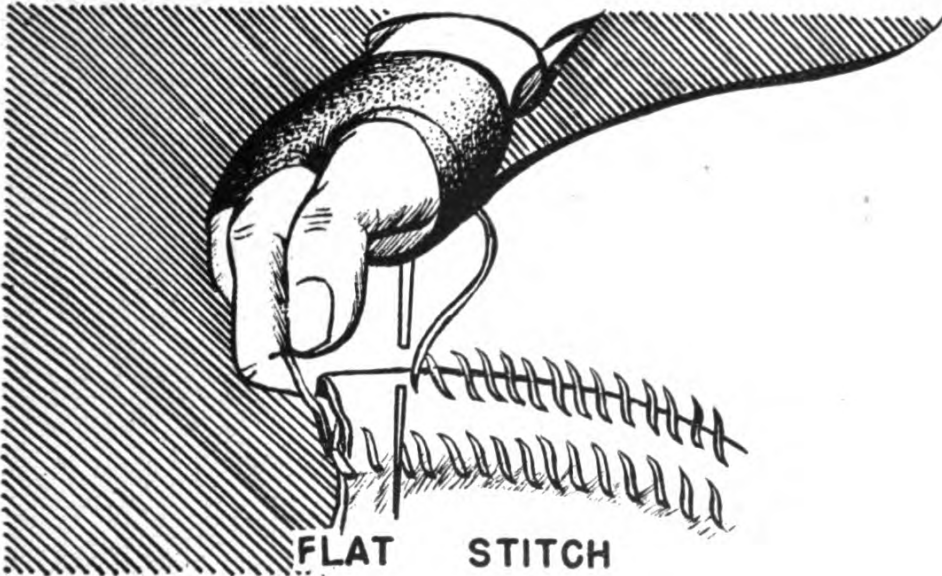
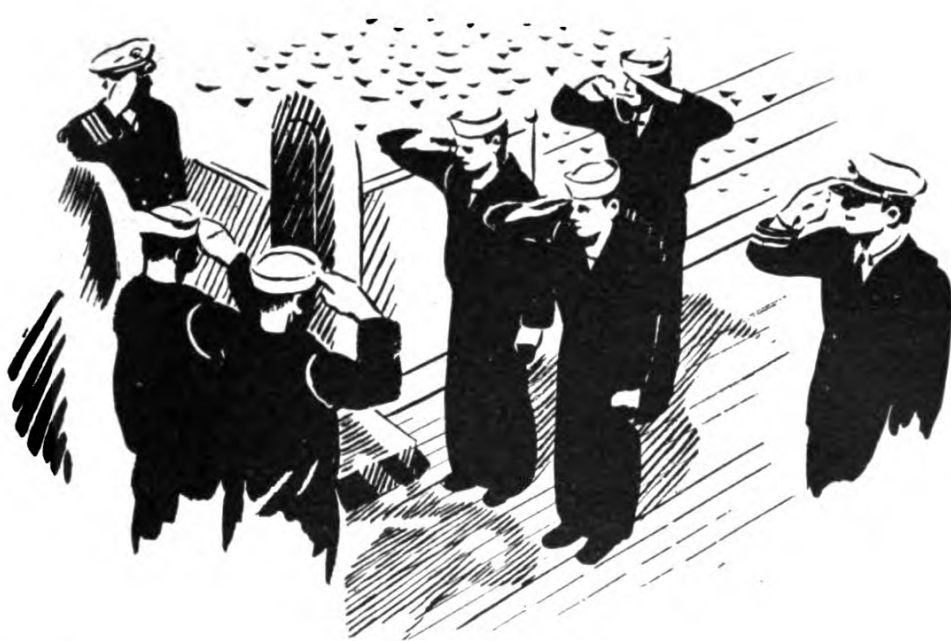


Figure 38.—The flat stitch.

This is the stitch used for making seams on sails, paulins, etc. It is the one you will most likely use. Here again, however, let your pattern be your guide. Use the same stitch on the new cover as was used on the old one.

And now, you are on your own. The rest is up to your skill as a "palm and needler."



CHAPTER 5

THE BOATSWAIN'S CALL

WAKY, WAKY, RISE AND SHINE

*All hands, all the hands—Heave Ho! Heave Ho! Heave Ho!
Lash up and stow, lash up and stow.
Wakey, wakey rise and shine, the morning's fine;
You've had your time and I've had mine.
The sun's scorchin' your bleedin' eyes out.
Beautiful dreamer, lash up and stow—
The cooks to the galley have gone long ago.
Show a leg, show a leg; make a move!*

That's British for "hit the deck" and English sailors hear the chant every morning at 0630. As a Boatswain's Mate in the United States Navy, you'll use the Boatswain's pipe to wake the crew, pipe the sweepers, announce chow and so forth but you won't have to learn any long chants.

Use of the Boatswain's call is an art. You won't learn it from the printed word but printed words will help you learn. Secure the services of an ex-

perienced Boatswain's Mate as a teacher and you'll be piping calls like an old master in no time at all.

If your instructor holds his call differently than illustrated here, don't worry about it. Almost every Boatswain's Mate holds his call a little differently—and each way is the best, according to the individual Bosun's Mate.

TUNING

You may find that the call issued to you does not produce a note that is shrill enough. That means

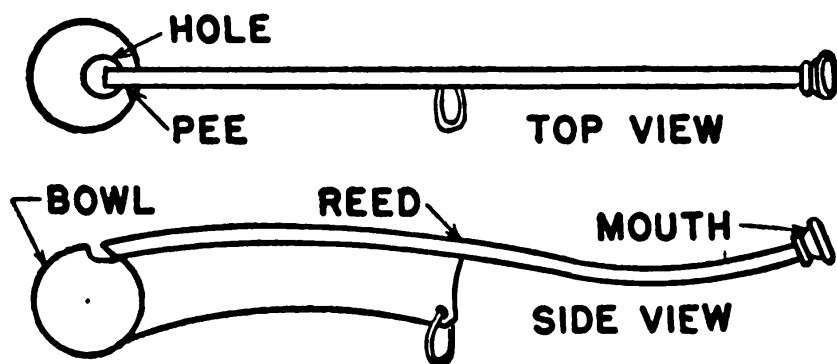


Figure 39.—The pipe and its parts.

tuning it and, here again, each Boatswain's Mate has his own ideas on the subject.

Most calls are too open at the PEE and have to be flattened or soldered to fill the space between the pee and the bowl.

Some calls are improved by scraping the wind edge or edge of the bowl farthest from the pee. Sometimes, it is necessary to enlarge this hole by scraping as well as by sharpening the edge until the reed strikes the hole fair. You can test this by pushing the large end of a broom straw through the reed. The wind edge of the hole should split the straw.

Once you have tuned the call, it should sound if held with its mouth to a gentle breeze. When blown

with open hand, it should sound from the slightest wind pressure to the full strength of the lungs without a flaw in the sound. (Such a flaw is known as wind leak or hoarseness.) When blown with closed hand, the sound should be as clear and shrill as it is possible to make it.

Parts of the pipe, in addition to the PEE, are the BOWL, the REED and the MOUTH.

THE SCORE

The four positions of the hand—OPEN, CURVED, CLOSED and CLINCHED—are indicated on the four spaces of a musical staff in this manner—

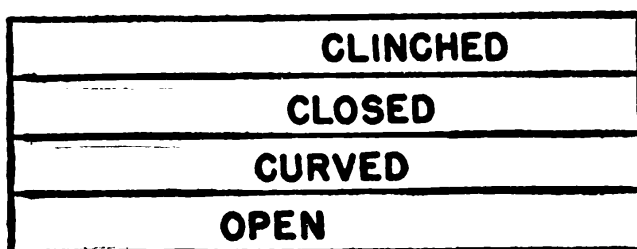


Figure 40.

A STRAIGHT line indicates a SMOOTH note.

A DOTTED line indicates a RATTLED note.

A BROKEN line indicates an UNDULATING note.

FULL ARROWHEADS along a line indicate FULL breath IMPULSES.

HALF ARROWHEADS along a line indicate GENTLE breath IMPULSES.

Intervals, or rests, are marked by a straight vertical line and the number of seconds is marked above the line.

The number of seconds each pipe should be given under normal conditions is marked above the bar. Note, however, that circumstances often call for the signal to be shortened.

SMOOTH notes are produced as they would be on

any ordinary whistle and are raised or lowered by the amount of lung force used.

RATTLED notes are made by rattling the tip of the tongue against the roof of the mouth.

UNDULATING (wavy) notes are produced by

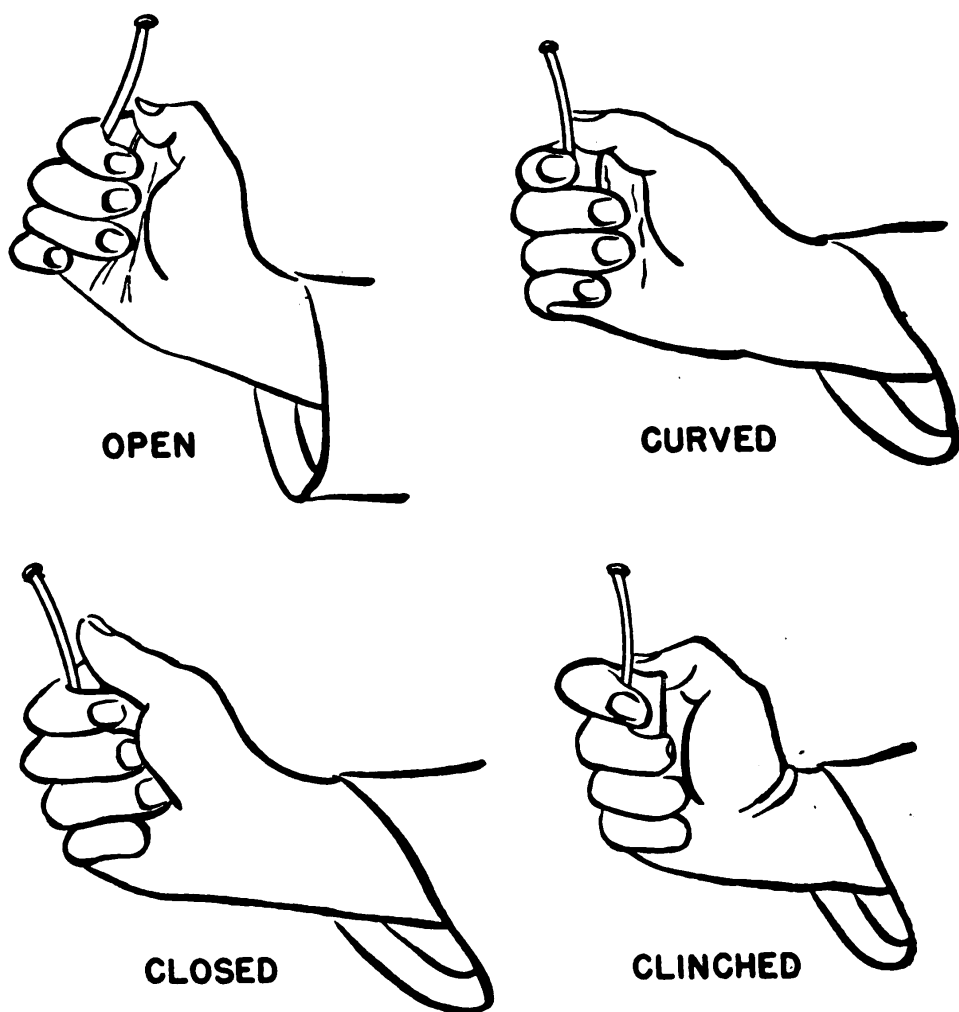


Figure 41.—The four positions of the hand.

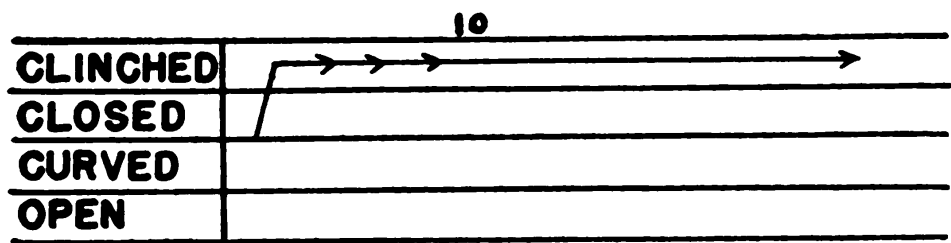
slight motion of the tongue while the throat checks the lung pressure or flow of breath.

The four positions of the hand are shown in figure 41. Note that the degree of closure of the hand is indicated by the extent that the fingernails are showing. The lung force you will use varies with

the position of the hand. As a rule, the open hand calls for the least pressure required to make a soft, clear note, while the clinched position requires full lung pressure to produce a shrill, clear note.

PIPES AND THEIR USE

WORD TO BE PASSED—Piped to command silence before passing an order or information.

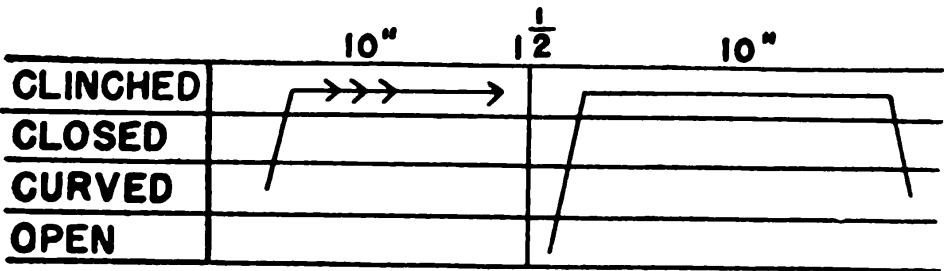


Begin with the call in the closed position and clinch within a second. Impulse the shrill call with lung force about three times and end sharp.

The length of this pipe should be between 5 and 10 seconds. Sing out the words, “D’YE HEAR THERE,” wait for silence, and then pass the word as given by the officer of the deck.

On some ships, the words, “NOW HEAR THIS” are used instead of “D’YE HEAR THERE.” Likewise, some ships require that each word passed over the loud-speaker system must be repeated. Learn the correct procedure for your own ship and follow it carefully. Pass the word clearly and know what you are going to say before you say it.

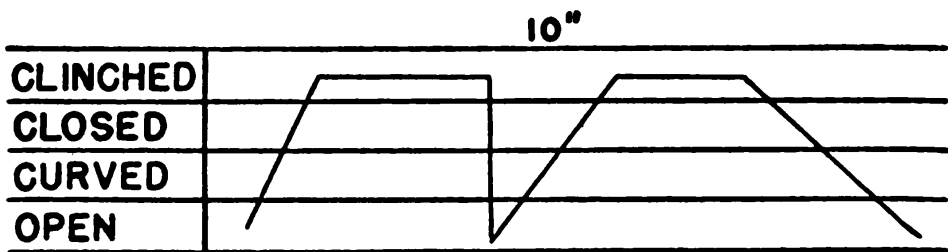
ALL HANDS—Piped as a general call for all



events in which “all hands” are to participate. It is also used for calling the first, mid, and morning watches.

Call in the curved, close to the clinched position and impulse softly about three times, hold the shrill for 10 seconds and end sharp. Again close to the clinched softly, hold the second shrill for 10 seconds, and allow it to fall softly to a finish for about 3 seconds.

BOAT CALL—Piped to call a boat. It is also used to call a division, or divisions, to quarters.



Call in the open, close to the clinched and hold the shrill for 5 seconds. Begin with the open again, close to the clinched, and hold the second shrill for 5 seconds. Now open and allow the signal to end softly in about 3 seconds.

In passing the word for a boat, the Boatswain’s Mate sings out a long drawn “AWAY” followed by the boat that is wanted. If the barge or gig is being called, the call is lengthened out further than the “away” for other boats and the word “away” is called twice—

“A—W—A—Y BARGE A—W—A—Y”

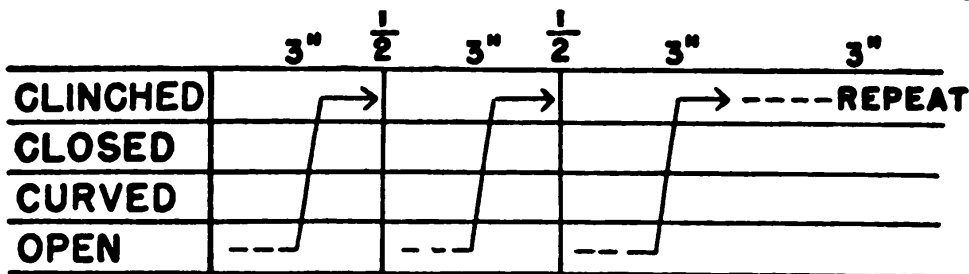
When calling a division to quarters, follow the call with—

“All the _____ division—to quarters.”

SWEEPERS—Pipes all sweepers to get to work with the brooms and to empty trash cans.

Begin in the open with a rattled note and close sharply to a short shrill. Repeat this three times and

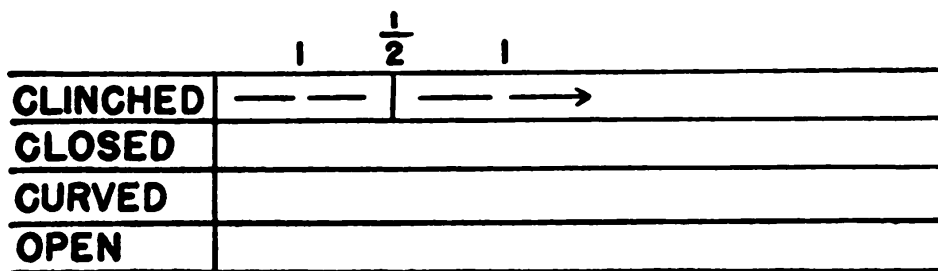
finish with four or five sharp peeps from the closed to the clinched in rapid succession. Repeat the entire call but, instead of finishing with the sharp



peeps, make an impulsed shrill sound as though slurring the peeps.

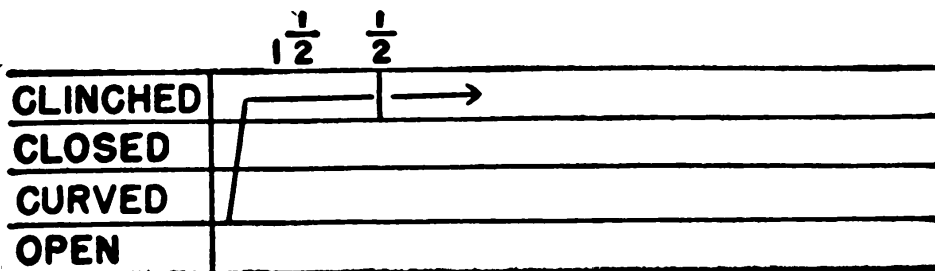
In some cases, you'll follow the call with the words, "Clear up the deck for quarters."

CALL MATES—Piped by the ship's Bosun to assemble his mates.



Call in clinched position to sound like "Peep" "Peep"—"Peep" "Peep". The call should be short and shrill with a pause of less than 1 second after the first two peeps. All Boatswain's Mates repeat the call as they proceed to the point of assembly.

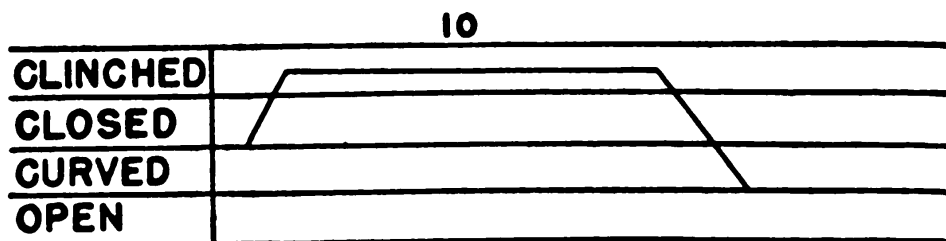
STAND BY—Piped for "stand by" and "set taut."



Start with the call in the curved position and change instantly to the clinch. This causes a rising

peep. Follow with a short, slurred peep and end sharply.

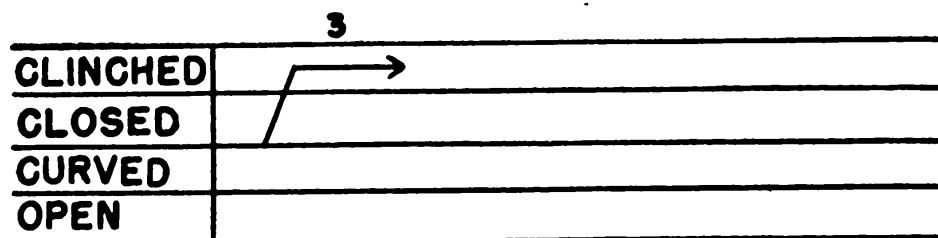
HOIST AWAY—Piped when hoisting boats and weights and in the walk away with the cat or fish falls. It is always preceded by the “set taut” pipe.



The pipe is the same as WORD TO BE PASSED but the shrill is not impulsed. Instead, it is softened by changing the position from clinch to curved and lung pressure is lessened so as to finish low and soft, instead of sharp.

The length of this pipe when used as the signal for a long walk away is about 10 seconds.

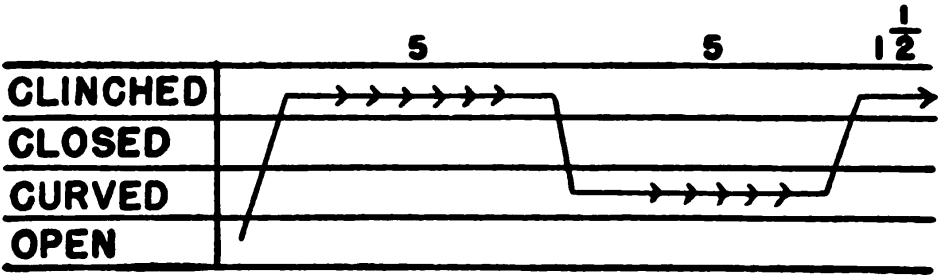
HAUL—Piped to keep the men pulling together.



Call in the closed and change to the clinched. Time it so that the sound in each position is the same length. Finish with a sharp shrill. Normal time about 3 seconds.

The pipe is sounded when the men are facing their work and at a standstill. The low note of the signal means “stand by”—the shrill note means “pull.” The length of the shrill note signifies the amount of line to be gained on the pull. As it is shortened, it becomes the first note of “short belay.”

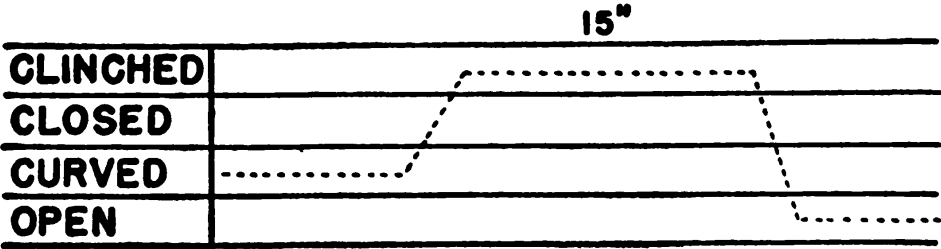
BELAY—Piped to avast hauling and make fast. It is also used to annul an order just piped.



Begin with the call open. Close sharply to the clinch and impulse with the tongue to the roof of the mouth about six times while holding the first shrill of about 5 seconds. Now change to the curved position and impulse softly with the breath and tongue to produce a smooth, wavy sound about as long as the impulsed shrill. Clinch sharply and finish with three shrill, slurred peeps in rapid succession.

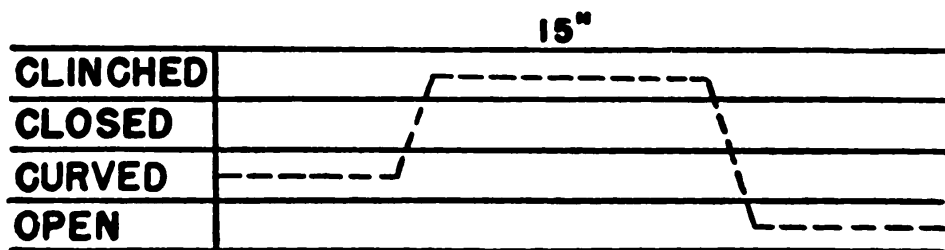
The “belay” is the most difficult pipe to blow. The “short belay” is more uniform in sound as it grows out of the “short haul.” A short “belay” means “hold fast.”

HEAVE AROUND—Piped for “mess gear.” Piped twice, it signals men to heave around a capstan.



Call in the curved position and blow very softly with an undulating sound. Do this by checking your breath with your throat and allow the tongue to undulate slowly. Then, in the clinched position, increase the rapidity of the undulations. Now allow the sound to fall back to the soft, low tones of the start.

VEER—Piped to “EASE AWAY,” “WALK BACK” and “SLACK AWAY.” A slurred veer calls side boys to tend the side. One veer calls 2 side boys; 2 veers, 4 sideboys; 3 veers, 6 sideboys; 4 veers, 8 sideboys.

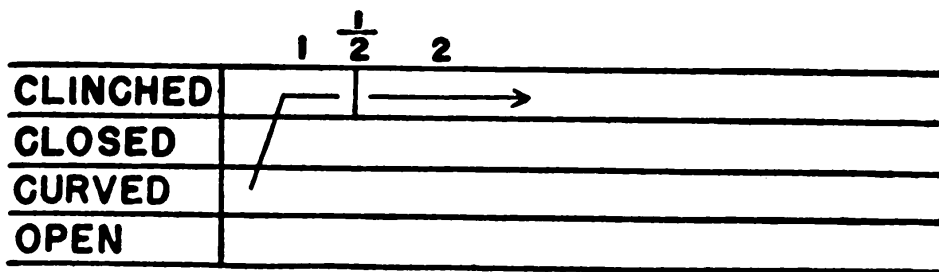


Call is in the curved position to begin. Produce a rattling sound by moving the tip of the tongue against the roof of the mouth. The rapidity of the tongue movement is in proportion to the pitch of the sound, rising to the maximum in the shrill rattle.

The pipe is sounded continuously for walking back the falls—during the walk back or the lowering from a belay. The speed of the lowering should be in proportion to the undulations of the pipe or to the rapidity of the rise and fall in sound. This change in sound, caused by changing from curved, or open, to clinched, is sometimes accentuated by impulsing with the throat. Short peeps, in this case, indicate to “lower handsomely” for a short distance.

At the finish of the lower, or at the “come up,” the signal is finished with a short, sharp peep as in the finish of “PIPE DOWN.”

PIPE DOWN—A combination of the pipe “word to



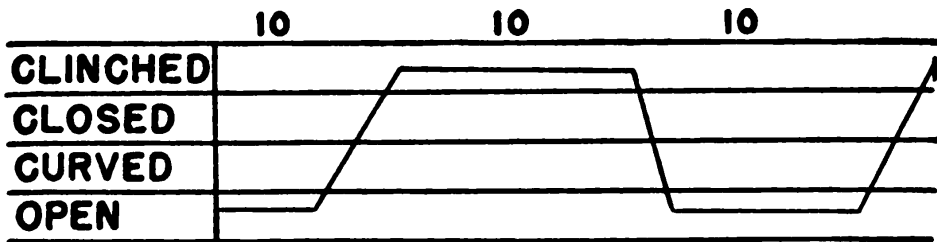
be passed” and a long veer of about 10 seconds with an interval of about 1 second between the two. It

ends with a short, sharp peep.

This pipe is blown by the Boatswain's Mate of the watch and signals the completion of ceremonies or functions to which all hands have been called. It is also sounded after taps.

PIPE TO A MEAL—Pipe “all hands,” a long “heave around” (mess gear) and a long “pipe down.” The combined calls should cover an interval of not less than 1 minute.

PIPING THE SIDE—This pipe accompanies appropriate side honors.



Fill the lungs, start with the lowest smooth note and rise to the shrill. Fall to the low note again and finish with a low, soft shrill.

The time in rising to the shrill should be about equal to the time you hold it and the time of falling from the shrill should be about one-third less than that of rising so that the combined fall and finish equals the time of rising to the shrill and holding the shrill.

The pipe “**ALONGSIDE**” is started so that it will end as the boat makes the gangway.

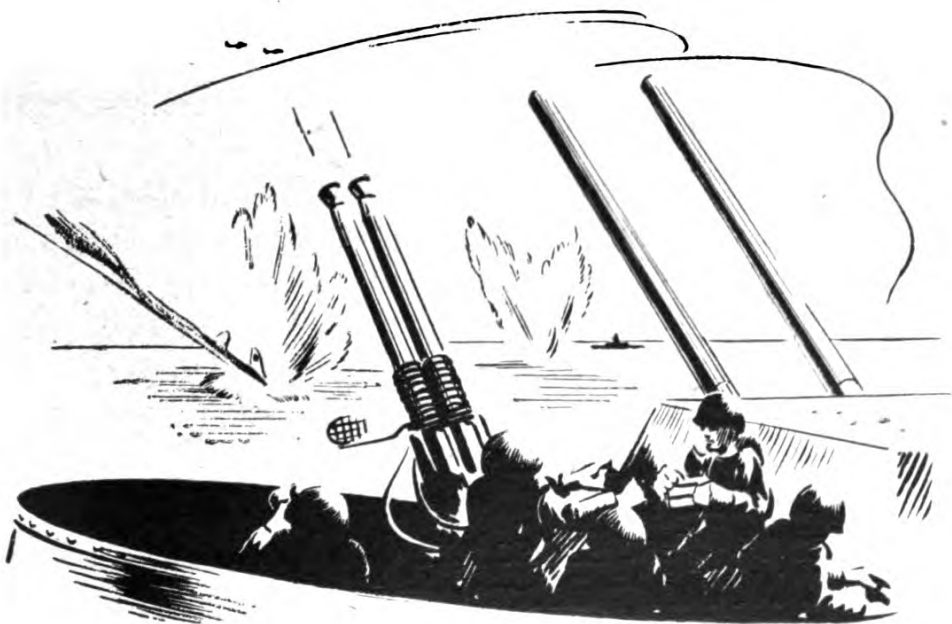
The pipe “**OVER THE SIDE**” should be started when the visitor's head, if he is ascending the gangway, is even with the level of the quarterdeck. It should end as the visitor is greeted by the officer of the deck who stands inboard of the line of sideboys.

At the first note of this pipe, the Boatswain's Mate takes his station to the rear of the proper outboard sideboy and salutes during the sound of the pipe.

The Boatswain's Mate begins the first note of "OVER THE SIDE" as the visitor passes him in departing and the first note of "AWAY" as the visitor's boat leaves the gangway. The "away" signal is brought to a long-drawn finish.

Side pipes should be as long as possible under the circumstances—they will naturally increase in length as the number of sideboys increases.

Side pipes that are too short are lubberly and contrary to the "etiquette of the side."



CHAPTER 6

THE BOSUN'S MATE AS A GUNNER

BATTLE STATIONS!

Combatant naval vessels are built for just one reason—to serve as sea-going mounts for guns with which to blast the enemy from his strongholds. All activity aboard a war ship is directed towards increasing the battle efficiency of the ship, towards making the ship a finely tuned and deadly weapon of destruction against the day when it closes with the enemy.

As a Boatswain's Mate 2c, chances are that you'll draw a gun crew battle station—a key fighting post on ships which were built to fight. Men with your rate have established an enviable record before you and you will be expected to fill their shoes.

For instance—

Arthur Howard Osborne, BM2c, was decorated by the late Frank Knox for his work as a gunner.

Serving as captain of a gun crew, Osborne proved

that a guy who wears those crossed anchors under his crow is something to be reckoned with. His ship took a torpedo full amidships and started for the bottom but Osborne kept on fighting.

Naval records show that Osborne refused to give up his post when "abandon ship" was sounded, keeping his gun at work until the last possible minute. Then he helped a couple of wounded mates to safety before seeking safety for himself. The then Secretary of the Navy said Osborne displayed "unselfish courage and endurance" and that was putting it mildly.

And so it goes. Those are the kind of shoes you must fill. Not only Osborne's, but the thousands of Osbornes, and Jones, and Smiths, and D'Agostinos, and O'Rourkes, who have enabled Uncle Sam's Navy to lead her country to victory in every war it has fought.

You must first KNOW your job, then you must DO that job to the utmost of your ability.

YOUR JOB AS A GUNNER

Qualifications for Boatswain's Mate 2c require you to know four basic gunnery duties. First, you must know how to station and train a gun crew. Second, you must know how to prepare a gun for firing. Third, you must know how to handle common gun casualties. And fourth, you must know safety precautions for handling explosives.

COMMANDS

These are the commands that you will relay to a gun crew—

"Stations!"

"Load!"

"Commence firing!"

"Silence!"

"Carry on!"

"Cease firing!"

"Secure!"

At "STATIONS," the crew goes to the gun, the men take their respective posts, and stand by for further orders. (The gun should be ready for any action required.) After the crew is posted, the target is designated, the type of fire (pointer or director) is indicated, and the range and deflection are given. On the larger guns, you can expect DIRECTOR fire. Smaller mounts, such as those on submarines and merchant ships, employ POINTER fire.

At "LOAD" the crew goes through the operation of loading the gun.

At "COMMENCE FIRING," the firing and service of the gun are started. The POINTER fires when the firing signal is given, or when he is on target, depending on the operation of the mount. The firing continues until the ammunition is exhausted or the command, "CEASE FIRING" or "SILENCE" is given. (The Commanding Officer authorizes the O.O.D. or gun captain to open fire at an enemy SUBMARINE immediately upon sighting it without waiting for a command. This applies ONLY TO A SUB. In all other cases, the crew waits for the command, "Commence firing.")

At "SILENCE," all hands cease operations and stand by. The command, an emergency order, may be given by an officer or ANY MEMBER of the gun crew who notices something wrong. If a crew man calls, "Silence!" he immediately indicates the observed defect.

"CARRY ON" is the command given when "Silence!" has been observed and the defect has been remedied. The crew resumes operations where it left off.

"CEASE FIRING" is the command that stops service and firing of the gun, and proper steps are taken to prevent further firing. The procedure depends on the type of gun. On bag guns, the firing circuit is broken and the primer removed from the

lock. With case guns, if the gun is hot from firing and contains a live round, it should not be unloaded for at least 30 minutes, during which time it should be safetied against accidental discharge. If a crew leaves a gun for any time, it should be left in a safe condition.

"SECURE" is the final command. Ammunition is returned to the magazines, spare parts are put away, unnecessary gear is stowed, and the gun is secured. As soon as possible after firing, the gun should be washed out, dried, and lubricated—if practicable—while the gun is still warm.

THE GUN CREW

Gun crews vary with the size and type of gun they serve. The crew of a 3"50 is typical enough, however, to give you a general idea of the positions on the team and how they are played.

The 3"50 is a double purpose gun that has more than proven its worth in action against surface vessels and aircraft. You'll find it aboard gunboats, destroyers, patrol craft, submarines, armed merchantmen, and other vessels.

THE CREW consists of a gun captain, pointer, trainer, sight setter, fuze setter, hot caseman, first and second loader, and additional loaders as needed.

THE GUN CAPTAIN (probably YOU) is in command of the gun and crew, and is responsible for the performance of both. In casting loose the battery, he directs the removal of gun covers, tompions and so on, and sees that all gear is clear of the gun for training. He has fire hose led out and connected, ammunition hoist covers secured open, and he reports when the gun is ready for firing. He operates the breech opening lever during fire, and controls the service of the weapon, enforcing safety precautions, directing the ammunition supply and order-

ing appropriate action in case of casualties. At cease firing, he reports whether his gun is loaded or not, and stands by for instructions. At secure, he directs the securing of the gun. He examines the gun for damage and assists his crew in the sponging, lubricating, bore-gaging of the gun and other duties.

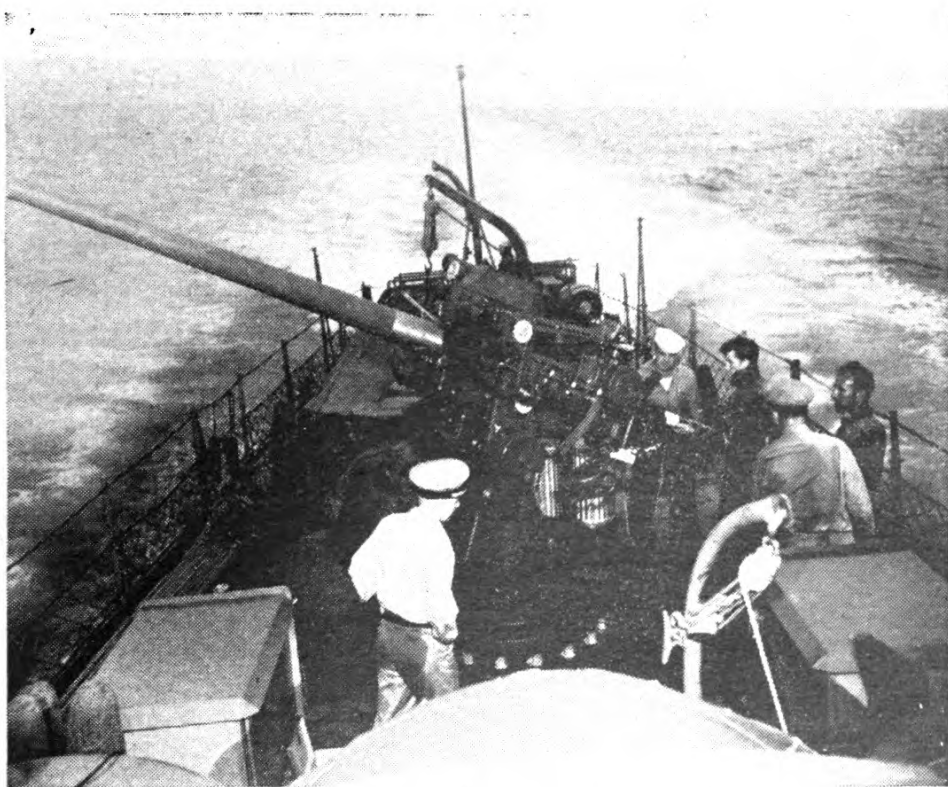


Figure 42.—Test firing the after 3" gun on the PC 488.

More specifically, your duties as a gun captain are—

To be thoroughly acquainted with the gun, know the duties of every member of the crew, and be able to instruct them in their duties.

Be able to station the gun crew, and conduct loading drills, pointer and trainer drills, and sightsetter drills.

Know the safety precautions, the misfire proced-

ure, and the casualties common to the gun, and the action to take in each case.

Before fire is opened, the gun captain must see that—

Crew is stationed properly.

Tompion is out of gun.

Ready boxes are opened and, in case of anti-aircraft fire, fuzes are set properly.

Firing circuit switch is closed.

Lighting circuit is tested, and dimmed flashlight available (for night firing.)

Cotton and First Aid kits are at hand.

Proper tools are at hand.

Thrust cam is set properly and operating lever disengaged from shaft.

Lanyard is available to hook into sear bar.

Report is made to control that gun is manned and ready.

During fire, the gun captain acts as “plugman,” operating the plug as needed.

Each time the gun is loaded, you report “Ready!” to the pointer. You must watch to see that the gun is functioning properly, returning to battery and so on. You also direct correction in case of casualty and re-cock the gun in case of misfire. If casualty is such as to interrupt fire, report to control.

The gun captain relays to the gun crew the orders received from control by the sightsetter. (With a well-trained crew this is ordinarily unnecessary, and the order is obeyed as soon as the sightsetter repeats it.)

At local control, the gun captain directs the firing, and acts as spotter. Under such circumstances, a substitute plugman should be designated.

THE POINTER operates the hand wheel which elevates or depresses the gun barrel (aiming it high or low, as the case may be.) Going into action, the

pointer removes dust plugs and caps from his telescope. If necessary, he cleans the lenses with his lens tissue. He focuses his telescope and sets the designated range on the convergence dial. He turns on the firing circuit switch, checks sight lights (for night firing), checks cross-wires with the trainer, and reports, "Ready!" to the gun captain.



Figure 43.—The crew of a 3-inch aboard the USS LONG ISLAND is ready and waiting to start throwing lead. Note the asbestos gloves worn by the "hot shellman."

Accuracy is the pointer's watchword—he keeps the target on the horizontal cross-hair in his telescope, and he fires the gun, using a footfiring mechanism, or the firing key on the hand wheel, or both simultaneously. He fires continuously while the sal-

vo signal is sounding, and sings out, "Fire!" as he presses the key. He must understand misfire procedure thoroughly, and if the gun fails to fire when he presses the key, he reports, "Misfire!" As "trigger man," then, he should understand the firing connections, methods of firing and safety precautions, and he should be drilled as much as possible in his routines. Some men, and good ones, too, find it impossible not to flinch when a gun is fired, and pointers should be tested for this tendency. Needless to say, the man who aims and fires a Naval gun can't be "gun shy."

THE TRAINER operates the training hand wheel which rotates the mount in a horizontal plane, or, to put it simply, in right or left train. He must remove dust plugs and caps from his telescope, clean the lenses if they need it, focus the telescope and set the designated range on the convergence dial. He checks sight lights (for night firing), checks sights with the pointer, and reports, "Ready!" to gun captain. Keeping the target lined up with the vertical cross-hair in his telescope he must match the pointer in skill and accuracy. The trainer should remember he is the pointer's junior team mate, and understand that he is training the gun for the pointer who designates the aim.

THE SIGHTSETTER corrects the sights in range and deflection, using information received from the spotter, or gun captain at local control. Going into action, he provides the telephone (if one is used) and connects it up. He then sets the sights as directed. By rotating the proper hand wheels, he can elevate or depress the sights from the axis of the gun bore, or deflect the sights to right or left from the axis of the gun bore. (Sights should always be set from "high to low" or "low to high" to eliminate errors through lost motion.) He repeats aloud all

ranges and deflections received and all orders received from control. He transmits all reports from gun captain to control. He examines sights after each shot, resetting if they have jarred out.

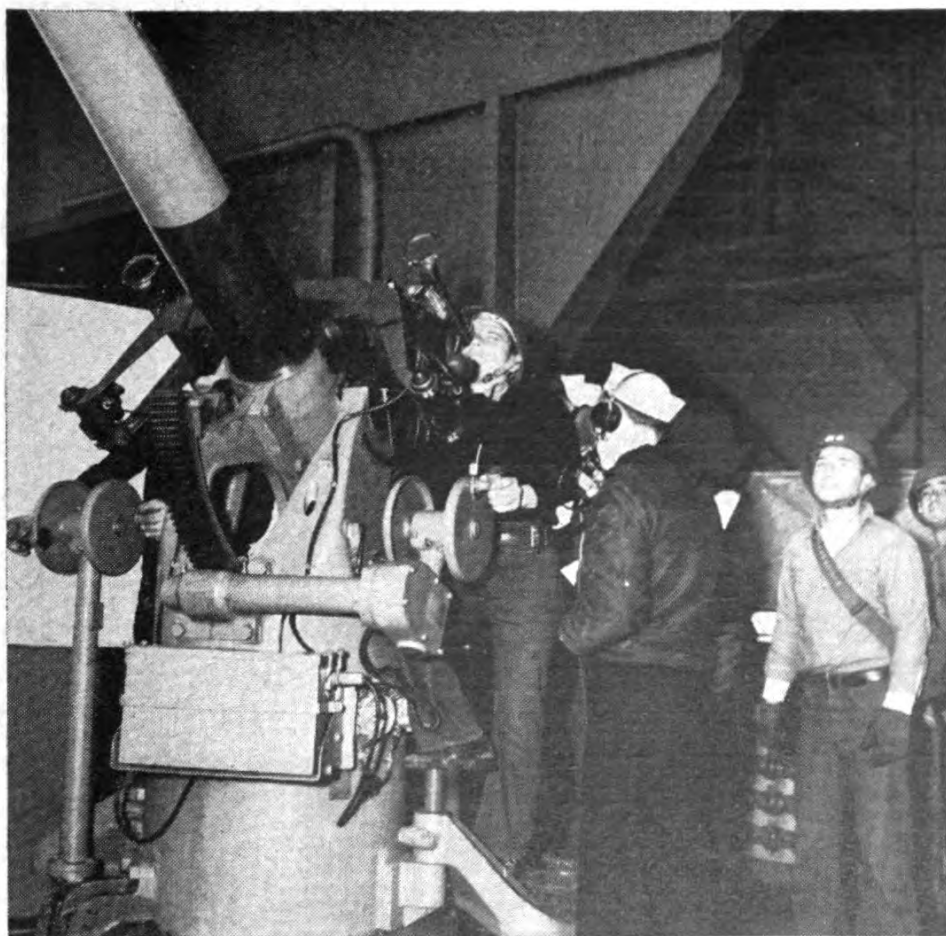


Figure 44.—Another 3" gun crew on the LONG ISLAND is also ready to meet the enemy.

If accuracy is the watchword of pointer and trainer, it is **DOUBLE ACCURACY** for the sightsetter. No matter how efficient the rest of the crew, the accuracy of the gun is no better than the sightsetting! Therefore, the sightsetter must be a carefully selected man who knows the orders that may be relayed from the fire-control system, knows the works

of his mechanism, has a steady hand and a cool head. Sightsetting drill should be carried on daily, and the sightsetter's work should be checked carefully.

THE FUZE SETTER sets the fuze in the nose of the projectile. The fuze is timed to explode the projectile at a specific moment. Fuzes may be set by hand with a special wrench, or by a fuzesetting machine in which the designated time is set and the fuze thereby adjusted. The operation calls for both skill and patience and the man must know ammunition and proper safety precautions. Fuze setting is particularly important when sending up a barrage against aircraft.

THE HOT CASEMAN, or "hot shellman" has a rugged job on his hands. Wearing asbestos gloves, he stands just out of the way of the recoiling breech (left of the plugman, facing leftward across axis of the gun) to catch the spent cases as they are ejected from the gun on counter recoil. Projectile cases are used again, so they aren't tossed around like spent cartridges in a shooting gallery. The hot caseman must see that they are stacked aside, or put out of the way, with some degree of care, and the job calls for energy and precision when the gun is firing around 30 rounds per minute. Having first glanced at the bore after firing, he calls, "Bore Clear!" or "Foul Bore!" to note the condition.

THE FIRST AND SECOND LOADER work as a two-man team, the second loader receiving the projectile from the fuze setter and passing it to the first loader who places it in the tray of the gun. Having placed the projectile in the tray, the first loader puts the butt of his right hand on the base of the case and rams the shell in the breech-smartly. When the breechblock has closed properly he taps the pointer on the back, signifying the gun is ready to fire.

THE FIRST LOADER stands to the left of the gun breech, facing to the right across the line of sight.

His left foot is placed just outside the "danger circle," his right foot about 2 feet behind his left, parallel to the axis of the gun. In this position, he receives the cartridge from the second loader. He then pivots slightly on the left foot, throws his right foot across the axis of the gun into a position enabl-



Figure 45.—"Practice makes perfect" and this crew aboard a U. S. Navy Cruiser makes sure it can handle that 3"50 when the lookout calls "Enemy aircraft at 1 O'clock."

ing him to put the weight of his right shoulder behind the cartridge when he drives it into the chamber. Once the cartridge has been seated, he pivots in reverse, returning his right foot to its original position.

The first loader should—

Check the bore, and call out, "Bore Clear!" before loading each shot.

Never take his eye off the gun breech, even when receiving the cartridge from the second loader.

Always keep the nose of the projectile well above or to the left of the recoil area, except when actually loading.

Make sure the cartridge is in line with the axis of the bore of the gun before seating it.

Continue to apply pressure to the cartridge until it is securely seated (otherwise the breech will not close properly.)

Move with the gun as it moves in train, maintaining his proper position relative to the breech.

THE SECOND LOADER stands directly to the right of the first loader, facing in the same direction. He must pass the cartridge to the first loader with accuracy, safety and speed. He holds the cartridge with his left hand about 6 inches behind the nose, his right hand a few inches forward of the base. His fingers should not cover the base of the cartridge, and his grip should not interfere with the first loader's handhold on the projectile. He should keep a sharp watch on the first loader's hands and accurately place the cartridge in them so that the first loader will not have to take his eye from the gun breech. The second loader also shifts with the gun in train.

ADDITIONAL LOADERS may join the crew to speed up the detail or service the "ready box" which contains pre-set ammunition with fuzes set for various ranges. Speed plus precision is the loader's aim, and each man should have a definite procedure and well-defined area of operation to avoid interference and

confusion. The loaders, like everyone else in the gun crew, have exacting responsibilities, and must be drilled thoroughly in team work.

ALL LOADERS should observe these rules—

After ammunition has been broken out, each loader should have a cartridge in his hands at all times until “Cease Firing.”

Loaders should never stand a live cartridge on its base.

Loaders should keep outside the “danger circle.”

Cartridges should be kept clear of the recoiling breech and ejected hot shell cases.

CASUALTY DRILLS

Practice in the handling of casualties to both men and ordnance material is a necessary part of any gun drill. In combat, of course, guns and men may be under fire and emergencies must be anticipated. And no matter how efficient a gun crew may be, a breakdown or malfunction may occur.

So it is vitally important that you and your gun crew be prepared to remedy a casualty “on the double” so that the service of the gun won’t be lost to the ship.

Suppose the enemy scores a hit? In case of injury to a crew member, the gun crew is drilled so that those remaining will continue on the job. The service of the gun may be slowed, but all gunners know they are to stick to their guns—a gun will not be abandoned, even by the last remaining man, as long as it can be loaded and fired.

The removal of personnel casualties is a matter provided for by each convenient position clear of the gun mount where corpsmen can give first aid and the man be removed to a dressing station. The operation of the gun should NOT be interrupted for per-

sonnel casualties except in cases of extreme necessity.

Casualties to personnel are handled by corpsmen and doctors.

In the event of casualty to the gun, you and the Gunner's mates are the doctors. Your First Aid kit is a kit of tools, and your knowledge and skill may have to do with mechanics instead of medicine, but your job in emergency is plenty important. You must know the defect and how to remedy it. For with guns, as with men, quick repair in battle is usually a matter of life or death.

CASUALTIES AND CORRECTION

Here are some of the casualties which may occur to Naval guns, including those of heavy caliber.

Broken rammer. Broken powder bag. Firing circuit jarred loose. Constriction in the bore. Failure of gas ejector. Misfire. Plug fails to open or close. Projectile not seated. Failure of hydraulic system. Jammed cartridge case. Failure of gun to recoil. Broken firing pin.

Casualties are as various as the many types of guns, and for the purpose of general discussion, those most common to the 3"50 are detailed in the following table.

COMMON CASUALTIES (3"50 GUN)

CASUALTY	CAUSE	REMEDY
Misfire (not due to faulty primer or mechanism.)	Firing key prematurely closed by pointer before breech fully closed.	Gun must be recocked. Gun captain should order "Silence!" Re-cock and order, "Resume fire!" (This casualty is the most common cause of misfire on the 3"50 gun.)

CASUALTY	CAUSE	REMEDY
M i s f i r e (electrical.)	No action of solenoid. Broken firing lead. Or firing switch not set at on position. Or solenoid burned out. Or broken firing key.	Fire by percussion — either foot firing or trip bell crank. Repair firing leads as soon as possible. Or if necessary renew solenoid. Or renew firing key.
M i s f i r e (firing pin.)	Broken firing pin. Or weak firing pin spring.	Renew firing pin or spring. (Although casualty is not frequent, all men in 3"50 crew should know how to install new firing pin. Gun out of action, if pin is either broken or so worn it won't contact primer.)
M i s f i r e (firing pin does not strike primer).	Worn operating shaft caused by failure to disengage operating lever clutch. Or debris from ammunition fouling breech.	To resume firing use rawhide maul to tap breech blocks in place. Renew operating shaft. Tap breech block into position. If fouled disassemble and clean breech mechanism. (Heavy grease should not be put in firing pin housing.)
J a m m e d breech plug. Shell not properly seated. Breech fails to close.	Poor loading — first loader at fault. Or deformed cartridge case.	Loaders must be well drilled. Gun captain should operate clutch and use breech operating handle as a lever to close breech block. Bottom of block should be tripped with rawhide maul to facilitate closing of breech. Ammunition should be checked before firing.

CASUALTY	CAUSE	REMEDY
Failure of semi - automatic feature of breech. Breech fails to remain open after ejecting empty cartridge case.	Voidance of recoil. Or worn extractors. Or weak extractor springs. Or worn breech block pallets. Burns or galling on breech block shaft or on block. Worn extractor plungers. Or possible failure to set cam for semi-automatic operation. (Too much tension on breech operating spring may cause breech to fly up and semi-automatic action to fail.)	Remove any or all parts mentioned in first 6 cases. (Always renew both extractors or both extractor springs, both breech block pallets at the same time. One new one and one old spring would cause uneven result in failure of semi-automatic feature.) Remove burrs or galling from any part of breech block or shaft. During firing gun captain must trip salvo latch and open breech with breech operating handle to permit loading next shell. Extractor springs should be checked for length (permanent set) and elongation. And tested under weights against a new spare. Replace if much difference is evident.
J a m m e d cartridge case.	Empty case split open, fails to extract.	Use cartridge case hand extractor tool.
Failure of operating spring. Connecting - rod drain and rod.	Material failure of parts.	Renew spring, rod-chain, or rod. Life of chain and rod can be greatly increased by having proper tension. Check tension by running in with dull cartridge in the gun. This checks automatic action of plug. Replace rod if it has elongation of $\frac{1}{2}$ " or over.

CASUALTY	CAUSE	REMEDY
J a m m e d cartridge case. (Case full of powder. Shell properly seated.)	Poor loading. Shell loosened from case when case hit side of breech. Or shell loose in rim of case due to drying of shellac.	Specially prepared cartridge case with rim cut off about 2½", so that it will fit behind seated shell, can be used to fire shell out. Casualty not frequent. Case should be prepared and stowed near-by for such emergency. (If case unprepared, in time of action this casualty could stall gun for about 5 minutes.)

SAFETY FIRST

Here are some safety rules for you to remember. Although they apply to the operation of a 3"50, they are typical for all Naval guns. Follow the rules. Keep your gun as well as yourself and other personnel off the casualty list.

Before a gun is fired, all personnel should be clear of the recoil. This means all hands stand clear of the "danger circle."

Before initial loading, the crew should be sure the bore is absolutely clear. The gun captain should personally inspect to make certain.

Before firing, the gun captain should be certain that there are no obstacles in the way.

No man should get behind the breech, or near the muzzle of a gun that is loaded and may be fired.

When a gun is to be fired, a hose should be connected to a fire main and kept at hand.

The salvo latch should not be touched by any member of the gun crew. After each firing it should be checked.

The plugman should not "ride the plug." (On automatic fire, this does not apply.)

Whenever possible, before firing, the gun should be run through its full arc of elevation and of training, and foot firing and electrical firing should be tested.

All handling of ammunition should be reduced to a minimum to prevent accidents. Ammunition, of course, should be handled with care. Nose fuzes, being sensitive, should be kept clear of recoiling guns, hot cases or anything liable to deal them a glancing blow. Naturally, they should not be dropped.

If a fuze projectile is dropped nose down or sideways, the command "Silence!" should be given. The loader who dropped the projectile should be ordered to put it overside.

In fact, "Silence!" should be ordered when ANY projectile is dropped. Fuzed or not, if dropped from a height of 5 feet, it should be put overboard.

NEVER stand a cartridge on its BASE. Reason: the primer is sensitive and might explode if plumped down on a bolt-head or some lumpy object.

Projectiles or fuzes must never be tapped or altered, and fuzes should never be removed or disassembled aboard ship.

The first loader should hold his hand over the pawl while ramming the shell home.

A force greater than that which can be applied by hand alone should not be used in loading a live cartridge into the gun. The first loader should remember to keep his eyes fixed on the breech.

The breech should be closed as soon as the gun is loaded. This means IMMEDIATELY.

Battery marks are provided on the gun. A member of the crew should observe these marks after each shot to see that the gun returns to battery. This condition should be assured before the announcement "Ready!" is given.

In action, if the gun fails to return to battery and is out of battery by more than 2 inches, the pointer

and trainer should joggle their handles and the rest of the crew should push the gun back into battery. If the gun is out by less than $\frac{1}{2}$ inch there will be no

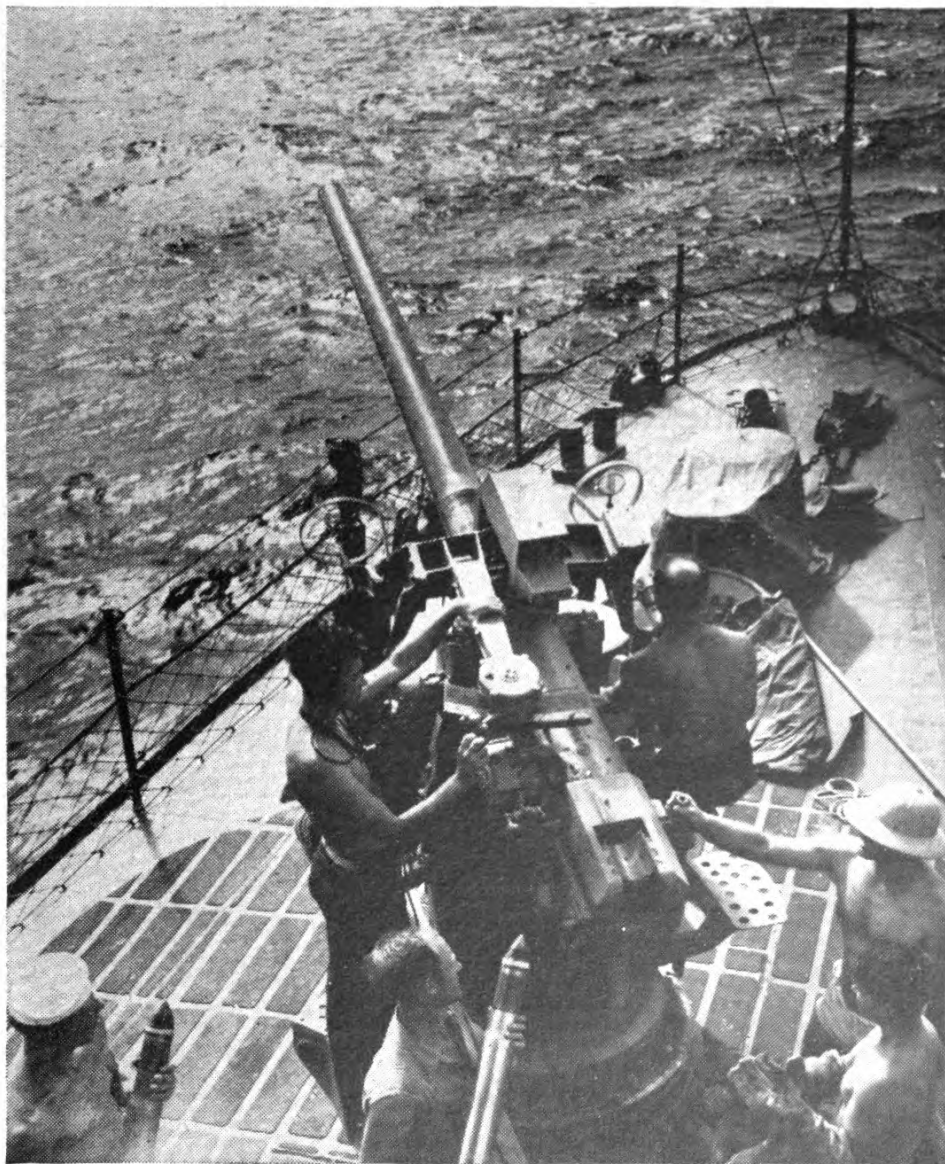


Figure 46.—The gun crew of the forward 3 inch on a PC practices for the real action to come. Barebacks are OK for drill but not for combat.

lapse of gunfire. If the gun cannot be returned to battery it must be put out of service.

Any casualty to the gun mechanism should be reported promptly to the Gunnery Officer.

In case the gun is loaded and the order comes through to "Cease Fire!" the Fire Control Officer should be informed and the gun pointed in a safe direction until further instructions have been received.

If there is a misfire, the pointer calls out, "Misfire!" and all members of the gun crew should immediately sing out, "Silence!" Loaders and hot shellmen should turn away, protecting ammunition with their bodies until the gun captain has carried out the misfire procedure and given the word, "Carry on!"

In the above instance, the gun captain should report the misfire, designating the gun. The gun should be re-cocked and an attempt made to fire it again. After all attempts to fire by all circuits (at least twice) have failed, the malfunction is reported as a "hangfire." The Fire Control Officer should be informed.

In case of a hangfire, the gun must be trained on a safe bearing, and the crew awaits the instruction of the commanding officer on unloading. The crew should stand clear of the breech, and the Gunnery Officer supervises the unloading. All men not immediately concerned should keep at a safe distance.

In no event, except in action, should the gun captain drop the plug while a hangfire exists.

After the last attempt to fire, in case of misfire or hangfire, the breech should not be opened for 30 minutes. In time of action it should be opened only on orders from the gun captain or battery officer.

If a projectile becomes lodged in the bore, a short case should be used to eject it through the muzzle. It should not be backed out if it is possible to eject it through the muzzle with a "short."

Before all firing practices, the filling of recoil cylinders should be witnessed by the Gunnery Officer.

The cylinders should be inspected at frequent intervals for possible leaks and the same reported to the First Control Officer.

When a gun is to be unloaded, all men not directly concerned should be kept at a safe distance from the gun.

And here's a final safety measure—the gun crew should WEAR COMPLETE CLOTHING, clean if possible. The old picture of the gunner with bare back glistening with sweat is out. Why the blouse? It can prevent bad burns. And the cleaner the better—in-
surance against dirty wounds and infection.

LOOK AT THE RECORD

The more you know about guns and their operation, the better you can understand and service them. A Boatswain's Mate must be a good all-around man—where ships are concerned, where boats are concerned, where GUNS are concerned.

The World War 2 record being made by the United States Navy is the work of men who know their jobs—and have stuck to their guns. Better marksmanship, better men behind the guns, and you've got a team that's hard to beat. Does it pay off? Look at the record. Ask Hirohito!

**How Well Do You Know The Duties Of A—
BOATSWAIN'S MATE 2c**

QUIZ

CHAPTER 1

"BOATS" AT WORK

1. Steering a Naval vessel is not hard if you keep your wits about you. What is the most common error made by an inexperienced wheelsman?
2. One of your duties as a Boatswain's Mate 2c is to see that the seamen under your jurisdiction keep their bedding clean. When is the most opportune time to inspect blankets and mattress covers?
3. Describe the most important safety measure to be taken when refueling a boat or airplane.
4. What is the chief difference between an ordinary moor and a flying moor?
5. What is a rat guard?

CHAPTER 2

HANDLING BOATS IN SURF

1. Navy landing craft are familiarly known as "Elsies" from the abbreviation LC. What does the abbreviation LCP(L) mean? LCM? LCVP?
2. As coxswain of a landing craft, why should you always try to hit the beach—or a bar—while your boat is riding on the back of a wave?
3. What is your chief cause of worry when handling a boat in the surf? (Besides enemy opposition.)
4. Experts advise you to back a landing craft off the beach slowly. Why?
5. Tell how you would spin your boat around after backing off a beach.
6. Describe the use of a DROGUE.
7. How can you use an anchor and anchor line to simplify the beaching of a whaleboat?

CHAPTER 3

BOATS AND FLOATS

1. Name two important recent additions to abandon ship lifeboat and life float equipment.
2. Cast adrift in a life float, you discover a piece of yellow bunting amongst your supplies. What use would you find for it?
3. You would also find a 4×5 inch mirror aboard. You could use it to check the growth of your beard but it also has an important use with relation to your chances of rescue. What is it?
4. What type of equipment would you use to haul boats aboard a large aircraft carrier? Aboard a DE?
5. Describe the use of frapping lines.
6. Why must you pay particular attention to the way in which you hook a block to the ring of a boat when it is to be hoisted aboard ship?
7. Bamboo poles come in mighty handy when hoisting or lowering an airplane. To what use are they put?
8. The GUN TACKLE PURCHASE entails the use of two single blocks. How many—and what kind of blocks—would you use for a LUFF TACKLE?

CHAPTER 4

DECK SEAMANSHIP

1. You've got to put an eye in the end of a wire rope. Right away! Pronto! There's no time for splicing. How will you do it?
2. Describe the 35 fathom marker on an anchor cable.
3. Name three kinds of stitches used in sewing canvas.

CHAPTER 5

THE BOATSWAIN'S CALL

1. That Boatswain's call of yours is not shrill enough. What to do? Get a new call?
2. Name the parts of a call.
3. What are the four positions of the hand when using the Boatswain's call?
4. After what call would you sing out "D'ye hear there?"
5. Take out your call, go to some spot where you can't be heard, and practice the BOAT CALL, SWEEPERS, and STAND BY.
6. When should the pipe OVER THE SIDE be started?
7. How would you time this pipe?

CHAPTER 6

THE BOATSWAIN'S MATE AS A GUNNER

1. Name four of the commands given to a gun crew.
2. There is only one situation when the O.O.D. or gun captain is authorized to open fire without waiting for the command "Commence Firing." What is the situation?
3. Explain the duties of a sightsetter on a 3"50.
4. The hot caseman is sometimes called by another name. What is it?
5. What is the proper command for a gun captain to give when a fuzed projectile has been dropped on its nose? What do you do with the projectile?

ANSWERS TO QUIZ

CHAPTER 1

"BOATS" AT WORK

1. Giving the ship too much rudder when correcting the course.
2. When bedding is aired along the rails.
3. Attaching the grounding cable to prevent fire or explosion due to sparks.
4. See page 18.
5. A funnel-shaped or flat piece of metal attached to mooring lines when a ship is docked. The guard prevents rats from boarding the ship via the hawser. In some cases, it is also utilized to keep rats from going ashore.

CHAPTER 2

HANDLING BOATS IN SURF

1. LCP(L), Landing Craft, Personnel, large. LCM, Landing Craft, Mechanized. LCVP, Landing Craft, Vehicle, Personnel.
2. So that your stern grounds first.
3. BROACHING.
4. Too much speed tends to suck the stern down.
5. See page 37.
6. See page 41.
7. See page 41.

CHAPTER 3

BOATS AND FLOATS

1. Fishing kit and water desalting equipment.
2. To attract the attention of passing ships and aircraft.

3. As a signalling device, using the sun and Morse code to flash your message.
4. A crane. Davits.
5. They are used to keep the boat from swinging against the side of the ship while being hoisted or lowered. See text.
6. To avoid a crushed hand.
7. They are used as fending poles to prevent the plane from being smashed against the ship.
8. Two blocks, one single, one double.

CHAPTER 4

DECK SEAMANSHIP

1. With wire clips. See page 76.
2. The second studded link on each side of the shackle has two turns of wire around its stud and the two links on either side of the shackle are painted white.
3. Herringbone, baseball, round stitch, flat stitch. (Any three of the four gives you 100 percent on this.)

CHAPTER 5

THE BOATSWAIN'S CALL

1. No. Tune it until it is right. See text on how to tune.
2. The bowl, reed, mouth and pee.
3. Clinched, closed, open, curved.
4. After piping "word to be passed."
5. Not good enough. Practice some more.
6. When the visitor's head is on a level with the quarter-deck.
7. So that it ends just as the visitor is greeted by the O.O.D.

CHAPTER 6

THE BOATSWAIN'S MATE AS A GUNNER

1. Any four of these and you're OK: Stations, Load, Commence Firing, Silence, Carry On, Cease Firing, Secure.
2. When you've sighted a submarine.
3. See page 102.
4. The "hot shellman."
5. Silence. Throw it overboard.

QUALIFICATIONS FOR BM 2c

(A) PRACTICAL FACTORS.

- (a) HOISTING AND LOWERING BOATS, PLANES, AND WEIGHTS.—Demonstrate ability to hoist boats, planes and heavy weights in own ship.
- (b) SEAMANSHIP.—Demonstrate ability to splice a wire (eye splice and long splice) and fit a wire in a socket.
- (c) GUNNERY.—Demonstrate ability to station a gun crew and be able to instruct and train each member in his duties. Demonstrate ability to prepare a gun for firing.
- (d) BOATSWAIN'S CALL.—Demonstrate ability to pipe all shipboard calls.
- (e) PALM AND NEEDLE.—Demonstrate ability to make a canvas article required on board ship.
- (f) D-5204, (A).

(B) EXAMINATION SUBJECTS.

- (a) BOATS.—Equipping and provisioning of boats and rafts. Handling boats in surf.
- (b) GROUND TACKLE.—Methods of overhauling anchors, chain cable, and shackles.
- (c) GENERAL SEAMANSHIP.—Procedures for preparing to enter port, going alongside, and getting underway.
- (d) GUNNERY.—General knowledge of the gun casualties which are likely to occur in battle, and the procedures for handling. Working knowledge of safety precautions in handling ammunition and explosives.
- (e) EMERGENCY DRILL EQUIPMENT. — Detailed knowledge of the location of all equipment used and the limitations of each piece of equipment.
- (f) GENERAL.—Duties of the Boatswain's Mate of the watch at sea and in port.
- (g) D-5204, (B).



Please . . .

Take good care of this training course. It is only loaned to you. When you have completed the course return it to your Educational or Divisional Officer for reissue. This book must be reissued until it becomes unfit for further use. If the Navy is to continue issuing sufficient training courses to meet the increased demands of its enlisted personnel, it must exercise the strictest economy in the use of its books. Please cooperate!